TO COMPARE SAFETY AND EFFICACY OF ORAL MISOPROSTOL (25 MICROGRAM) WITH INTRACERVICAL DINOPROSTONE GEL (0.5 MG) FOR CERVICAL RIPENING AND INDUCTION OF LABOUR

DESSERTATION SUBMITTED IN FULFILMENT OF THE

REGULATIONS FOR THE AWARD OF

MD OBSTETRICS AND GYNAECOLOGY

DIVISION OF OBSTETRICS AND GYNAECOLOGY

PSG INSTITUTE OF MEDICAL SCIENCES AND RESEARCH

THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY

GUINDY,CHENNAI,TAMILNADU,INDIA

APRIL 2014

TO COMPARE SAFETY AND EFFICACY OF ORAL MISOPROSTOL (25 MICROGRAM) WITH INTRACERVICAL DINOPROSTONE GEL (0.5 MG) FOR CERVICAL RIPENING AND INDUCTION OF LABOUR

DESSERTATION SUBMITTED IN FULFILMENT OF THE

REGULATIONS FOR THE AWARD OF

MD OBSTETRICS AND GYNAECOLOGY

DR.T.V.CHITRA MD DGO.,DNB

DIVISION OF OBSTETRICS AND GYNAECOLOGY

PSG INSTITUTE OF MEDICAL SCIENCES AND RESEARCH

THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY

GUINDY,CHENNAI,TAMILNADU,INDIA

APRIL 2014

Certificate

CERTIFICATE

This is to certify that **Dr. MEENAKSHI PRIYA** has prepared this dissertation entitled **"A COMPARATIVE STUDY OF SAFETY AND EFFICACY OF ORAL MISOPROSTOL (25 MICROGRAM) WITH INTRACERVICAL DINOPROSTONE GEL (0.5MG) FOR CERVICAL RIPENING AND INDUCTION OF LABOUR".** under my overall supervision and guidance in the Institute of PSG Institute of Medical Science and Research, Coimbatore in partial fulfilment of the regulations of Tamil Nadu **Dr. M.G.R Medical University** for the award of **M.D. Degree in Obstetrics and Gynaecology.**

Dr. T.V.CHITRA MD DGO., DNB, Professor, Department of Obstetrics and Gynaecology, PSG Institute of Medical Sciences and Research, Coimbatore- 641004	**Dr. SEETHA PANICKER MD DGO., DNB.,** Professor and Head, Department of Obstetrics and Gynaecology, PSG Institute of Medical Sciences and Research, Coimbatore- 641004

Dr. S RAMALINGAM,

Principal,

PSG Institute of Medical Sciences & Research,

Coimbatore – 641004.

Declaration

DECLARATION

I hereby declare that dissertation entitled **"A COMPARATIVE STUDY OF SAFETY AND EFFICACY OF ORAL MISOPROSTOL (25 MICROGRAM) WITH INTRACERVICAL DINOPROSTONE GEL (0.5MG) FOR CERVICAL RIPENING AND INDUCTION OF LABOUR"** was prepared by me under the guidance and supervision of **Dr. T.V. CHITRA MD DGO., DNB.,** PSG Hospitals Coimbatore.

The dissertation is submitted to the Dr. M.G.R. Medical University in partial fulfilment of the University regulations for the award of MD degree in Obstetrics and Gynaecology. This dissertation has not been submitted for the award of any Degree or Diploma.

Acknowledgement

ACKNOWLEDGEMENT

I wish express my sincere thanks and gratitude to my Professor **Dr. T.V.CHITRA MD DGO., DNB.,** Department of Obstetrics and Gynaecology, PSG Institute of Medical Science and Research for her guidance and encouragement all along in completing my study. She showed me different ways of approach to study the problem and the need to be persistent to accomplish my goal.

I am extremely thankful **Prof. Dr. Seetha Panicker MD DGO., DNB., Prof. Dr. Reena Abraham MD., DGO.,** Department of Obstetrics and Gynaecology, PSG Institute of Medical Science and Research for their cooperation extended for this study. I wish to record my gratefulness and feeling of indebtedness to them for the support given to me during the period of the study.

I am so grateful to the **Principal Dr. S. Ramalingam and Medical Director Dr. Vimal Kumar Govindan,** PSG Hospitals for permitting me to carry out this study.

I am indebted to all teaching staff, colleagues, interns and all the labour ward staffs of my department, for their valuable suggestions, cooperation and auxiliary attitude. I am extremely thankful to all the patients who were the most important part of my study.

I am ever grateful to my parents and my husband for being a constant source of support and encouragement.

DR. R.MEENAKSHI PRIYA

Contents

CONTENTS

Introduction

INTRODUCTION

Labour induction is an obstetrical intervention designed to artificially initiate the process of cervical effacement, dilatation, uterine contractions and eventually delivery of the baby[1]. The indications are postdated pregnancy, gestational diabetes, hypertensive disorders, fetal growth restriction and pre labour rupture of membranes. Sometimes it is essential to induce labour when the risk to the mother and / or fetus with pregnancy continuation outweighs the risk that are involved with intervention. Prolong labour, increased instrumental delivery and increased cesarean section are more associated with Induction of labour with an unfavorable cervix compared to spontaneous onset of labour or induction of labour with a favorable cervix[2,3].

The success of labour is decided by the improvement in the bishop score. Therefore, it is necessary to use optimal techniques for cervical ripening and safe confinement.

There are many methods for labour induction which includes, prostaglandins, mechanical methods, membrane sweeping, oxytocin, antiprogesterone etc.

Uterine contractions are caused by the endogenous PGs. Some prostaglandins can be less shelf life and are not cost effective. One of the common methods to improve the bishop scoring and labour induction ever since 1968: PGE2 gel. Widespread use of this drug is limited because of its high cost, adverse effects and thermal instability leading to difficult storage[4,5,6].

Because of the high costs and limited administration route of dinoprostone in recent years attention has turned world-wide towards another prostaglandin, "misoprostol", in the initiation of human labor at term. This medication, initially designed for the treatment of upper gastrointestinal ulcers has been shown to be an successful agent for induction of labour, when administered vaginally[7,8].There are more trials on use of this drug compared to any other drug in obstetrics and gynaecology. Finally after federal drug agency (FDA) approval in USA and the drug is used widely.

Misoprostol is 15deoxy16hydroxy16CH3PGE1(PGE1) was the first synthetic analogue made available for the treatment of peptic ulcer[9]. Impressed by its stimulant action on the uterus Sanchos Ramos in 1993 used it for obstetrical indication. They act on the myometrium and causes contraction of smooth muscle fibres and cervical ripening [10]. The peak

plasma concentration occurs at 30 minutes and then declines rapidly after oral administration [11] . It is stable at room temperature and does not require refrigeration[12]. There is no evidence that dinoprostone gel is superior to oral misoprostol and it has lower rate of uterine hyperstimulation because the absorption of PGE1 is many tie s lesser when compared to PGE2. Oral PGE1 is particularly attractive because of easy and non invasive usage, particularly on an op basis[13].

Rationale For Studying Misoprostol Administration In The Oral Form In The Induction Of Labour:

Unlike vaginal preparations, oral labour induction agents reduces the number of pelvic examinations and thus reduces the incidence of chorioamnionitis by preventing repeated inoculation of cervix with lower vaginal organisms.

Finally, as misoprostol was developed for oral administration, vaginal absorption has not been well studied.

It is possible that oral misoprostol to induce labour might have a more smooth and predictable dose response curve than the vaginal misoprostol. We wished to evaluate whether or not misoprostol when administered orally, (the route for which it was marketed for its

gastrointestinal indications), would also be an effective and safe agent when compared to standard care in labour induction at term.

Al1 prostaglandins administered orally for labour induction in previous reports had an unacceptable gastrointestinal side effect profile.

Randomised control trial have investigated the role of PGE1 in initiation of labour at term by improving the bishop scoring. The risk of caesarean section is reduced with oral misoprostol than convention dinoprostone gel. The advantages of oral misoprostol is that it is inexpensive, easy to store and easy to administer.

The objective of this study is to determine whether oral misoprostol can safely and effectively replace dinoprostone gel for cervical ripening in women at term with an unfavourable cervix and intact uterus.

Aim & Objectives

AIM

A comparative study of safety and efficacy of oral misoprostol (25 microgram) with dinoprostone gel (0.5mg) for cervical ripening and induction of labour.

OBJECTIVES

PRIMARY OBJECTIVE:

To compare safety and efficacy of oral misoprostol (25 microgram) with intracervical dinoprostone gel (0.5 mg) for cervical ripening and induction of labour

SECONDARY OBJECTIVE:

1. To compare change in bishop score
2. To compare mode of delivery
3. To compare the need for augmentation of labour in active phase
4. To compare patient satisfaction
5. To compare side effects and neonatal outcome

Review Of Literature

REVIEW OF LITERATURE

Labour induction is the process of initiating and augmentating the delivery of the fetus and placenta.

HISTORIC PERSPECTIVES:

The ability to induce has been of interest to many societies, from primitive to the ancient to the modern. There are two basic methods for labour induction, mechanical and chemical. There are various regimens that have been developed during the course of time in both of these areas. Information regarding primitive obstetrics is minimal. The depicters of primitive life, which have been archaeologically discovered, either in cave paintings or artefacts, were left by men. The birthing room, however was often closed to men and therefore was a mystery to them. Some concept of primitive medium can however be gleaned from observations of Native American practices.

Chemical methods of labour induction used by Native Americans were varied. Rattlesnake's rattles were powered and administered in potion. Another potion was derived from bear claw scrapings. Additional

therapies included teas from the blossoms of Indian corn and berries of ground cedar bushes [14]

Dr. John Williams, a physician to the Green Bay Indian Agency, described the practice of a medicine man keeping before a parturient with a gourd in one hand that he constantly rattled and a pipe in his mouth from which he would blow smoke against her genitalia. It is not known whether this was a method to induce or to augment labour [14].

An observation of the parite tribe described the practice of having the pregnant women slowly decrease her consumption of food as she approached term. Physician in Greece, Rome and other contemporary societies wrote about labour induction. Hippocrates recommended two methods. One was nipple stimulation which would lead to uterine contractions and initiation of labour.

Soranus of Ephesus (AD 130) described the need for labour induction in patients with a small pelvis. The procedures that he recommended included emptying of a full bladder. Substances like water, oil, honey are mixed and given to empty the bowel; egg whites into the vagina to soften and relax the cervix.

The Arab physician Abel Casis added to digital dilation a number of instruments that were used for labour induction and labour augmentation (15).

In the 16th century the French obstetrician Ambrois Pare derived another instrument for mechanically dilating a women's cervix (16). The major achievement in labour induction was a convention in London in 1756 that addressed for the first time the issue of labour induction in patients who had deformed pelvis. It was done by rupturing the membranes. This was adopted by Dr. Thomas Denman.

James in 1776 suggested that premature labour can be induced by venesection (17). Dewees, in the early 19th century believed that resistance of circular muscular fibres in uterus could be overcome by bleeding. In 1810 Professor James Hamilton suggested manual stripping of membranes from lower uterine segment and then high rupture of membranes. This method gained popularity. In 1846, Dr. Kiwisch proposed using a stream of tepid water into the vagina, with labour commencing from 5-6 days. It was abandoned because of severe maternal mortality rates due to uterine rupture. In 1855, sponge tent developed. In 1891, Pinard published 100 cases of premature induction of labour.

In the late 19th century and early 20th century cervical dilatation continued to be much in vogue. In 1894 Lee developed a balloon that can be called a colpeurytner. The method of mechanical dilatation of cervix using bags or balloons reached its apogee with the Voorhees meteruynter. This was a rubber covered canvas bag that was deflated, inserted into the cervix and inflated with water.

In the early 20th century ergot, quinine and pituitary extract became the primary medications for the induction of labour. In 1909 William Blair Bell started using pituitary extract, which he called infundibulin to initiate and augment labour. In 1928 Abel and Vincent identified the posterior pituitary hormones, oxytocin and vasopressin. In 1949, the first modern inducing agent, oxytocin was developed by Vigneaud. In 1953 he had synthesized oxytocin and showed that it was identical to natural oxytocin.

In 1969, chemists were able to synthesise prostaglandins and stated the era of the use of prostaglandins in labour induction [18,19]. Karim first reported success with intravenous infusion of prostaglandin F, both this compound and prostaglandin El have been used widely for this purpose. Due to the unique effect of prostaglandins on the uterine cervix, they represent an excellent option for women who, on account of their

unfavourable cervix, are poor candidates for induction using oxytocin. Furthermore, because prostaglandins are effective when administered either locally or systemically, local administration has the advantage of requiring much lower doses of prostaglandin and avoids the problem of untoward side effects provoked by intravenous prostaglandin administration. The recent stable PGE2 preparation available in the market ,mainly vaginal pills and gel has boosted the clinical use of prostaglandins both for making the cervix favourable and for inducing labour.

HISTORY OF PROSTAGLANDINS:

In 1930, Kurzrock and Lieb, demonstrated the uterotonic effects of fresh human semen in vitro[20]. Substances capable of provoking contraction of smooth muscle fibres were found in seminal fluid, by Goldblatt in 1933 and Von Euler 1934[21]." Von Euler named these substances 'prostaglandins." Bergstrom and Sjovall isolated the first prostaglandin (PGFalpha) in 1957"and in 1964; the biosynthesis of several uterotonic prostaglandins was achieved. In 1969, Embrey suggested that equipotent doses of PGE2 were equally useful for elective induction of labour[22]. Prostaglandins are known to play an important role in the physiology of human labour and it is likely that a late step in the

complicated series of events preceding the process of labor initiation is by endogenous local release of these substances. Most of the early clinical research was conducted with PGF2alpha, because it was thought to have more uterotonic activity and because of the initial "shelf instability" of PGE2. since the early 1970's, a significant number of trials for PG's for labour induction have been conducted, studying issues of efficacy, different modes and administration routes.

From beginning there were various trials comparing intravenous PG's and IV syntocinon. Discovery of other different PG's administration routes, the various trials have been made comparing placebo, intravenous and buccal oxytocin and also PG's in different routes and doses . The prostaglanding used for cervical softening has been studied comprehensively in various prostaglandin types, doses, and routes of administration [(48).] Meta-analyses have shown that prostaglandins are superior to placebo and oxytocin alone in ripening the cervix [(49).]

Misoprostol (synthetic analogue of PGE1) has been the subject of numerous recent articles describing its use as a cervical ripening agent. Doses of 25 to 50 microgm administered vaginally or orally have been implemented in various trials to be successful in improving the bishop score.[(50)]

CERVICAL RIPENING AND INDUCTION OF LABOUR:

Cervical ripening whether physiological or pharmacological is the conversion of rigid cervical sphincter associated with maintenance of pregnancy to a compliant and readily dilated structure. Cervical ripening occurs due to change in the cervical connective tissue. The major cellular component of the cervix is collagen and glycosaminoglycans (GAG) along with small amount of elastin. The commonest GAG in the cervix is chondroitin and dermatan sulphate. Obrink et al showed that the lower affinity of hyaluronic acid to bind with GAG molecule will destabilise the collagen. Alteration in the ratio between proteoglycan and GAG concentration can therefore alter the collagen affinity and accelerate collagen breakdown. Danforth et all 1960 (23) showed that the connective tissue of term cervix has less stable collagen fibrils with increase in intercellular matrix when compared to early gestation and non gravid state. There appears to be selective hyaluronic acid increment and selective decline in chondroitin sulphate (Von Maillot et al 1979 [24]) compared to non gravid cervix.

Cervix score also known as Bishop score, is a method used to assess the cervix in pre labour to predict whether labour induction will be required[25].Bishop [4] developed a method for predicting the cervical favourability in multiparous patients with planned elective induction of

labor in which 0 to 3 points are given for each factor in the scoring system. When the cervix score was 9 and above, the probability of vaginal delivery was statistically insignificant between induced labour and spontaneous labour.

The cervix score comprises of the following five components on vaginal examination:

- Cervical dilation(closed to full dilatation)
- Cervical effacement(uneffaced to well effaced)
- Cervical consistency(firm to soft)
- Cervical position(post to ant)
- Fetal station(-3 to +3)

Cervical scoring system categorises the antenatal mothers who would be the prime candidates to have a vaginal delivery. Bishop score and labour duration were not directly proportional; the bishop scoring of more than eight defines the antenatal mothers who are most likely to have vaginal delivery. Cervical ripening methods should be used before other methods with cervical scoring system of less than or equal to 5.

MISOPROSTOL:

A synthetic analogue which is not recommended by Federal Drug Administration for labour initiation and ripening of cervix but American college of obstetrics & gynecology recommends misoprostol and it is on WHO essential drug list for induction of labour[(26).] Misoprostol is efficient smooth muscle stimulant. Many trials indicate its efficiency in oral administration [(27).] PGE1 is quickly absorbed when given orally. It is not recommended for intravenous use. Other routes of administration are sublingual [(5),] rectal [(6),] and vaginal. The major advantage of PGE1 is the ease of storage, transportation and good shelflife [(28)]. Because of its oral route of administration there is increased patient satisfaction.

A number of controlled trials which are published have shown that misoprostol, administered either vaginally or orally, is effective in improving bishop scoring and initiation of labour [[53].]

In 1996, a double blind trial by Ngai et al in Hong Kong compared a single 200 microgm oral misoprostol dose versus placebo for softening of cervix, in PROM at term. Twelve hrs later if the participants were not in progressive labour, an intravenous oxytocin induction protocol was begun. Thirty-nine subjects received oral misoprostol, with 41 receiving

placebo. The Bishop score was significantly improved with misoprostol (P<O.O5). Thirty-four women given misoprostol went into labour without oxytocin, compared to 20 of those given placebo (P<0.001) . Interval to onset of uterine activity and delivery were both shorter with misoprostol (P<0.01). There were three caesareans in each group. Neonatal outcomes and gastrointestinal tolerance were comparable. The author recommended that oral PGE1 is an efficient mode of induction in this group of people [31]. Results published by Ramoz and Shetty et al concluded saying the same [32]. Case reports were published with regard to the risk of rupture uterus during labor induction with misoprostol.[33] Results published by Bique et al demonstrated the safety profile of misoprostol when used even in grand multiparous women with no significant adverse maternal or neonatal outcome.

Ghazala et al determined the safety and efficacy of stepwise oral misoprostol (initially 50 μg followed by 100 μg every four hours upto maximum four doses) with vaginal misoprostol (25 μg every four hours up to maximum four doses) for initiation of labor, they concluded that irrespective of mode of administration the improvement in the cervical score was similar between both groups. The risk of tachysystole and c section rate was less with oral misoprostol when compared to vaginal PGE1 [34].

Alfirevic Z et al showed that, the ongoing trials have failed to prove that oral PGE1 is re is no evidence that oral misoprostol is substandard to the vaginal PGE1. The systemic absorption of PGE1 is many times lesser when compared to vaginal PGE1 and hence proves that the risk of tachysystole is less with oral PGE1[35].

Cheng SY et al showed that In order to avoid uterine hyperstimulation, current suggestions are in favor of oral misoprostol given in small, frequent doses, titrated according to uterine response [36].

It has been proved by many researchers by doing many controlled trials on animals that there is no risk of fetal malformation, deformation or any kind of teratogenicity to the fetus [37,38]

Randomised control trial by Windrim R et al showed that differences in the dose of administration (ranging from 50 mcg to 200 mcg) or intervals between the subsequent doses or single dose did not have much side effects in the controlled subjects of the study [39].

Abbassi's study, showed that even with low total dose of oral misoprostol (150 μg), the failure rate was only 2.5% in induction of labour [40] .The failure rate remains high with vaginal misoprostol (12-15%). In this study the induction delivery interval was 6.7±4.4 hours.

Nigamas study showed that Oral PGE1 has been effective in reducing the duration of active phase of labour with no significant difference in neonatal outcome. [41]

Cochrane review of trials with oral misoprostol has shown a lower risk of caesarean section [35] In Nigam's, Dallen's and Dodd's studies this rate was 22.7%, 18% and 8.3% respectively[42].

Literature shows that Oral PGE1 may increase the chances of meconium stained of liquor [35]. The incidence of meconium staining in Dodd (16.2%) and Khatri (12%)[43] study.

Dodd et all compared 25 microgm misoprostol with dinoprostone gel and showed that the statistical significance between the two groups was not significant enough in the many variables compared: 46% of PGE1 had duration of labor more than 24 hrs when compared to 41.2% of PGE2 gel; caesarean section rates was higher with PGE2 (26.6%) when compared to PGE1 (22.7%); abnormal uterine contraction was noted in 0.8% of oral misoprostol and 1.6% in dinoprostone. They concluded that oral misoprostol and intracervical PGE2 are equally efficacious [42]

Trials using low doses of oral misoprostol, show low rate of caesarean section due to fetal distress and other complications but there were also less vaginal deliveries in 24 hours [44].

Shazia Syed et al showed that the efficacy of oral PGE1 as a mode of initiation of labor by assessing the ease of administration , duration of labour was found to be less than 24 hrs in 99%, whereas 27% of the study samples had c section in which 41% had fetal distress as the indication, 40% had MSL. Majority of the babies had good apgar at delivery. Tachysystole was noted in 0.4% [45]

Kundodyiwa TW et al study compared oral PGE1 (25 microgram) with PGE2 gel and vaginal PGE1, doses administered frequently like every 2 hours showed that the c section and hyperstimulation was more with PGE2 and vaginal PGE1.[46].

An initial meta analysis by Sanchez Ramos et al showed a significantly reduced caesarean delivery rate for patients induced with oral misoprostol (25 microgm) [54]. Follow-up meta-analyses have shown that use of misoprostol has less induction delivery intervals and a greater percentage of antenatal mothers had vaginal delivery within twelve to

twenty four hours. No evidence of adverse perinatal or maternal effects has been noted by Sanchez-Ramos L, Kaunitz AM [55].

The number of subjects studied affords a power of at least 90% to detect a difference in neonatal intensive care unit admission rates of at least four percentage points (from 14% to 18%). Sufficient power also was noted for the detection of at least a doubling in the rate of abnormal 5-minute Apgar scores (from 1.4% to 2.8%).

Sanchez Ramos also showed that Compared to women who received dinoprostone, Foley catheter, or placebo, women who received 50 microgm misoprostol were two times more prone to develop abnormal uterine action, whose occurrence was directly proportional to the dose of misoprostol administered. Despite the increased incidence of hyperstimulation in the misoprostol group the number of caesarean deliveries performed for fetal heart rate abnormalities was similar regardless of the induction method used. Among all the patients induced with oral misoprostol , 84% went into active phase of labor , only 29% required acceleration. A significantly higher proportion of patients who received misoprostol experienced vaginal delivery within 12 hours (37.6% versus 23.9%). Similarly, 68.1% of patients who received misoprostol delivered vaginally within a day (24 hours). Use of PGE1 for

initiation of labour by improving the cervical scoring is associated with significant reduction in induction delivery interval (5 hours)[56] .

In seven randomized trials have compared oral versus vaginal administration of misoprostol for labour induction [38, 57, 58]. The oral doses ranged from 50 microgm to 200 microgm every 4 to 6 hours. Vaginal misoprostol was administered in doses that ranged from 25 microgm to 100 microgm every 3 to 4 hours. No difference was noted in people who had normal delivery with half a day to one day. Similarly, the induction delivery interval were not different. Proportion of patients who experienced increased uterine activity (tachysystole or hyperstimulation) was similar for both groups. No difference was noted for the prevalence of abnormal Apgar and rates of NICU admissions. The rate of caesarean delivery was significantly lower among women induced with oral misoprostol.

Kwon et al, Bennett et al,19 and Wing et al reported less effective inductions, whereas Windrim et al found a 50 microgm oral dose to be equally as effective in inducing labour as a 50 microgm vaginal dose[57,58]

In 2000, Jose L.Bartha compared oral PGE1with cervical PGE2 initiation of labour. 200 antenatal mothers were randomised to single

dose of oral PGE1 200 micro gm or cervical PGE2 gel 0.5 mg fourth hourly (maximum 2 mg). The induction delivery interval, prelabor rupture of membranes were shorter in oral PGE1 group.[60]

Because of the small number of studies that use oral misoprostol and the lack of uniformity in dosing, the most appropriate dose of oral PGE1 for labour induction has not been determined. Currently, it seems that oral doses of 100 mcg administered every 3 to 4 hours seem to be safe and effective. Further studies are needed to determine whether higher doses can improve efficacy without increasing the rate of adverse maternal and perinatal outcomes.

Two trials done comparing vaginal PGE1 with cervical PGE2(Prepidil) [38,61] People were randomised to receive 50 mcg with interval being 3 hours for 6 doses and second group received 25 mcg at frequency of every 3 hours for 8 doses. The studies compared the efficacy of single drug in different doses (25 and 50). Those who received 50 mcg had shorter induction delivery interval and no differences in overall caesarean or operative delivery rates, caesarean deliveries for fetal heart rate abnormalities, or neonatal intensive care admission rates. Although subjects who received 50 mcg of misoprostol experienced a greater incidence of tachysystole, no significant increases in adverse maternal or

perinatal outcomes were noted. Meconium-stained fluid was noted more frequently for patients who received 50 mcg of misoprostol. Given the reassuring perinatal findings noted previously, this latter finding is of questionable importance. Because these two separate studies by Wing et al [38,61] indirectly compared two doses of misoprostol—25 microg and 50 microg—they were incorporated into the current analysis. In total, 906 patients were compared: 479 received doses of 25 mcg and 427 received doses of 50 mcg. Patients who received the 25mcg dose had a lower incidence of tachysystole and hyperstimulation; however, they also had a longer interval to vaginal delivery, and a lower proportion of these patients delivered vaginally within 12 to 24 hours. No differences were noted in the caesarean delivery rate, caesareans performed for fetal heart rate abnormalities, operative delivery rates, or neonatal intensive care unit admissions.

In 2001, Michigan state university, USA. French L. Conducted a Cochrane study on oral PGE2 in induction of labour. The author found that it was associated with more gastrointestinal side effect compared with other treatment.

The five studies comparing low-dose oral misoprostol with vaginal dinoprostone had 2,281 participants. Oral misoprostol was associated

with lower incidence of caesarean delivery (20.6% compared with 26.7%). The statistical significance was not strong between any of the other primary or secondary impressions. There was significant heterogeneity in the analysis for the outcome of need for syntocin acceleration (*P:*0.11), abnormal uterine action without FHR changes(I2_83%, *P*_.001), and all maternal adverse effects (I2_51%, *P*_.67).[62]

Low-dose oral PGE1 was compared with vaginal PGE1 in only two trials[40,46] containing 426 participants. In this comparison, the only statistically significant difference was that women given oral PGE1 had less tachysystole (2% compared with 13%) than those in the vaginal misoprostol group.

One study compared two different regimens of oral PGE1 tablets in antenatal mothers with a low Bishop score.[63] One group received 25 mcg of oral PGE1 3 hourly for maximum 6 doses until they were getting three contractions every 10 minutes (irrespective of cervical dilatation). Oxytocin was only commenced if contractions later became inadequate or if the woman had received all six doses (this occurred in 77%). The other group received two doses of oral misoprostol 25 micrograms every 3

hours followed by routine oxytocin. There were no significant differences in any of the outcome measures of interest.

In a randomised double blinded control trial conducted by Dodd et al, he randomised 365 samples for oral PGE1 and another 376 for cervical PGE2 gel. The statistical significance of primary outcomes like induction delivery interval <24 hours(PGE1 46% vs PGE2 41%), c section (22% vs 26%), fetaldistress as indication for c section(8.8% vs 9.3%). Uterine hyperstimulation was seen in 0.8% of oral misoprostol and 1.6% of cervical gel. The statistical significance was not of much difference between the two groups with regard to adverse perinatal or maternal outcome.Women's satisfaction with oral misoprostol was assessed formally in only one study,[42] and more 58.8% expressed their liking for oral agent.

High doses of oral or vaginal misoprostol are clearly effective at achieving vaginal delivery, but previous reviews have raised concerns relating to uterine hyperstimulation and adverse fetal outcomes. Lowering the dose of oral misoprostol does not seem to have resulted in lower rates of vaginal delivery.[35]

A Cochrane review16 focusing oral misoprostol for induction of labour included two studies that used oral 200 microg misoprostol dose. This dose was associated with more tachysystole, but without evidence of better effectiveness in comparison with low-dose vaginal misoprostol. Most of the studies have used an oral dose of 50 mcg. It seems that higher oral doses (100 microg or more) are more effective, with more successful vaginal delivery within 24 hours. However, stronger uterine contractions and shorter labours have to be carefully balanced against more uterine hyperstimulation, adverse neonatal outcomes and possibility of uterine rupture.

In a trial conducted in Bangkok 146 women were randomised and divided into two groups , one group receiving 50 mcg of oral PGE1 and another group 25 mcg of vaginal PGE1. The induction delivery interval, improvement in cervical scoring, need for augmentation, complications like hyperstimulation and tachysystole,mode of delivery, neonatal apgar and need for NICU admissions were assessed. The induction delivery interval was longer with oral PGE1 (16 hrs) the neonatal outcome was equal among both the groups as per the apger score and the NICU admissions. The conclusion of the study was though the higher dose was used for oral administration the lesser vaginal dose was found to be more effective in improving the cervical scoring. [(66)]

Langenegger E.J. Odendaal H.J. Grove Det al randomised 200 patients to receive 50 mcg of oral PGE1 every 4h and another 200 to receive 0.5 mg cervical gel every 6h. As the primary outcomes the safety and efficacy of the drug was assessed by comparing the CTG and the induction delivery interval between the two groups. They failed to demonstrate any statistical significance between the two groups as far as the induction delivery interval is concerned. The CTG to demonstrate the fetal heart rate abnormalities was taken after each mode of induction and compared. The outcome was the heart rate abnormalities was non reassuring among the samples who had PGE2 gel induction when compared to PGE1. The suspicious and pathological variants of the CTG was not statistical significance between the two groups. Perinatal outcome did not significantly differ. The conclusion was both PGE2 and PGE1 are as efficacious as far as induction is concerned but with lesser difference of abnormalities of CTG as shown by the PGE2 group.[67]

Gherman RB et al in a randomised trial showed that Sixty patients were enrolled, with 29 randomized to the oral misoprostol arm and 31 to the prostaglandin E2 group. The data on 58 patients were eligible for analysis. Delivery occurred within 48 hours in 96.4% (27/28) of those administered oral misoprostol as compared to 76.7% (23/30) of those who received intravaginal prostaglandin E2 (P =.03). The mean time

intervals from the start of induction to delivery were similar between the two groups (1,496 +/- 120 vs. 1,723 +/- 230 minutes, P =.40). No statistically significant differences existed between the two groups with respect to intrapartum complications, tachysystole, uterine hyperstimulation or adverse neonatal outcomes[68].

According to NICE guidelines Induction of labour, for all women irrespective of parity, membrane and cervical status, caesarean birth was less likely to occur with oral misoprostol (50-100 microgram) when compared with PGE2.Maternal and fetal outcomes were comparable between oral misoprostol and intracervical dinoprostone. Compared with vaginal misoprostol(25 microgram every 4 hours , maximum dose 150 micrograms), primiparous women with unfavourable cervix given oral misoprostol (50 microgram every 4 hours, maximum dose 300 micrograms)were significantly less likely to achieve vaginal birth within 24 hours. However maternal and analyses of outcomes of all women suggested that oral misoprostol (50-100 microgm) may be associated with a reduced risk of caesarean birth. There were no perinatal deaths. Additional RCTs identified found vaginal misoprostol 50micrgms to have a higher incidence of uterine hyperstimulation when compared with oral misoprostol 100 microgms. Titrated low dose oral misoprostol 25 microgms was more effective in terms of achieveing vaginal birth within

24 hours and reduced the caesarean birth rate,in women with prelabour rupture of membranes.

Bartha et al [69] in his study said that though the induction delivery interval was less with the oral PGE1 the risk of hyperstimulation could not be outweighed.

ACOG Committee would like to emphasize that the following clinical practices appear to minimize the risk of uterine hyperstimulation and rupture in patients undergoing cervical ripening or induction in the third trimester[59]

1) If misoprostol is to be used for cervical ripening or labor induction in the third trimester, one quarter of a 1OOmcg tablet (ie, approximately 25mcg) should be considered for the initial dose.
2) Doses should not be administered more frequently than every 3-6 hours.
3) Oxytocin should not be administered less than 4 hours after the last misoprostol dose.
4) Misoprostol should not be used in patients with a previous cesarean delivery or prior major uterine surgery.

According to ACOG The use of higher doses of misoprostol (eg: 50 microgm every 6 hours) to induce labour may be appropriate in some situations, although there are reports that such doses increase the risk of complications, including uterine hyperstimulation and uterine rupture [(59)b]

Materials And Methods

MATERIALS AND METHODS

The study was conducted in the department of obstetrics and gynecology, PSG Hospitals, Coimbatore from August 2012 to August 2013.

STUDY DESIGN:

Prospective study

STUDY POPULATION:

Study group consisted of two groups. These groups constituted of pregnant women at term admitted to PSG hospitals for induction of labour for either medical or obstetrics reasons.

SELECTION CRITERIA:

1. singleton pregnancy

2. vertex presentation

3. bishop score<5

4. completed 37 weeks

5. need for induction

EXCLUSION CRITERIA:

1. multiple gestation

2. non vertex presentation

3. preterm

4. previous LSCS

5. multiparity

6. cephalopelvic disproportion

Patients who needed induction were identified and selected for induction by random allocation table. After obtaining informed consent they were induced with PGE2 gel and oral misoprostol by whichever method they were selected.

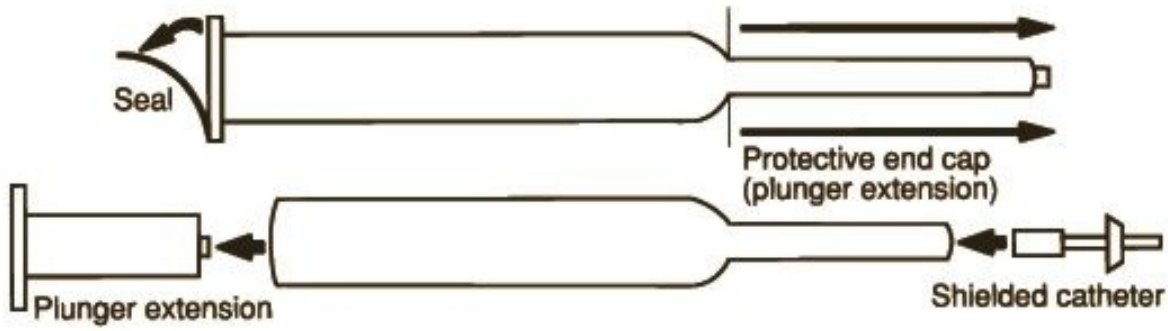
PATIENT PREPARATION:

Consent for induction after explaining about the method of induction. Any patient coming under exclusion criteria were excluded. After informed consent has been obtained, the patients selected for the study were evaluated initially by Bishop's score and admission test for fetal well being. Patients with Bishop's score <5 and positive admission test were induced.

PGE2 GEL PLACEMENT:

DINOPROSTONE PGE2 GEL:

Under aseptic precaution prostaglandin gel 0.5 mg is instilled endocervically.



ORAL MISOPROSTOL 25MICROGMS

- **Analysing criteria**:

104 patients with an indication for induction received 25microgm misoprostol orally and repeated for a maximum of 3 doses every 6 hours as needed.

107 patients with an indication for induction of labour received 0.5mg dinoprostone gel intracervically and repeated for a maximum of 3 doses every 6 hours as needed.

The bishop score was evaluated after each dose of dinoprostone gel whereas in oral misoprostol it was evaluated only when the patient had good contractions, bleeding or draining per vaginum otherwise it was analysed only after 3 doses.

The change in bishop score after induction was evaluated. If the score was moderately favourable it was augmented with vaginal misoprostol in both the groups. If the score was very favourable and in active phase of labour, it was accelerated with oxytocin or artificial rupture of membranes or both. Course of labour was monitored using a partogram and the following outcome were measured.

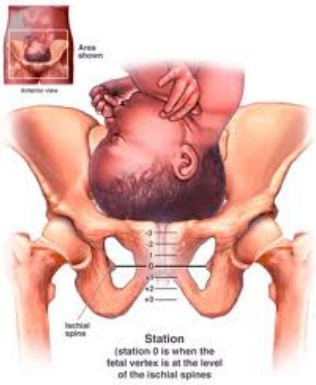
Outcome measure:

1. change in bishop score
2. time interval from induction to onset of adequate uterine contraction
3. need for augmentation of labour
4. mode of delivery
5. side effects
6. patient satisfaction and cost of induction
7. neonatal outcome

Bishop's system of cervical scoring was used to find the pre induction and post induction status of the cervix. A score of 5 and less than 5 was taken as criteria for induction and score more than 6 was found to be favourable after induction.

BISHOP'S SCORE

Cervix	Score			
	0	1	2	3
Position	Posterior	Midposition	Anterior	---
Consistency	Firm	Medium	Soft	---
Effacement	0-30%	40-50%	60-70%	>80%
Dilation	Closed	1-2 cm	3-4 cm	>5 cm
Baby's Station	-3	-2	-1	+1, +2



MODE OF DELIVERY:

The mode of delivery in these patients were noted. Caesarean section rates of both groups were compared.

DURATION:

The induction - delivery was analysed between these groups, to find out shorter duration of induction to delivery interval method out of these two methods.

AUGMENTATION AND ACCELERATION:

Need for further augmentation in both PGE2 gel and oral misoprostol groups were noted. In PGE2 gel group, if the bishop score is unfavourable then another dose was used, maximum 3 doses of gel were used at 6 hours interval. Still if the score was not very favourable it was

augmented with vaginal misoprostol 25microgram which was kept to a maximum of 3 doses four hours apart. Labour was accelerated with oxytocin and artificial rupture of membranes according to pervaginal findings.

In oral misoprostol group, reassessment was done after 3 doses or if there was strong contraction,bleeding or draining per vaginum. If the bishop score was not very favourable it was augmented with vaginal misoprostol 25microgram which was kept to a maximum of 3 doses four hours apart. Labour was accelerated with oxytocin and artificial rupture of membranes according to pervaginal findings.

PERINATAL OUTCOME:

APGAR SCORING

INDICATOR	0	1	2
HR	Absent	<100	>100
RR	Absent	Slow, irregular weak cry	Good vigorous cry
MUSCLE TONE	Flaccid, limp	Some flexion of extremities	Good flexion, active motion
REFLEX IRRITABILITY	NR	Weak cry and grimace	Vigorous cry, cough, sneeze
SKIN COLOR	Blue	Acrocyanosis	Pink

Results

RESULTS

During the study period, a sum of 211 patients were included.107 were induced with PGE2 gel(0.5mg) and 104 patients with oral misoprostol (25mcg). The two groups were statistically similar with respect to age and gestational age.

TABLE 1: AGE DISTRIBUTION OF PATIENTS

AGE IN YEARS	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
18-20	6	5.6	3	2.9
21-25	76	71.0	68	65.4
26-30	25	23.4	31	29.8
>30	0	0.0	2	1.9
Total	107	100.0	104	100.0
Mean ± SD	23.98 ± 2.49		24.65 ± 2.23	

Samples are age matched with p=0.041

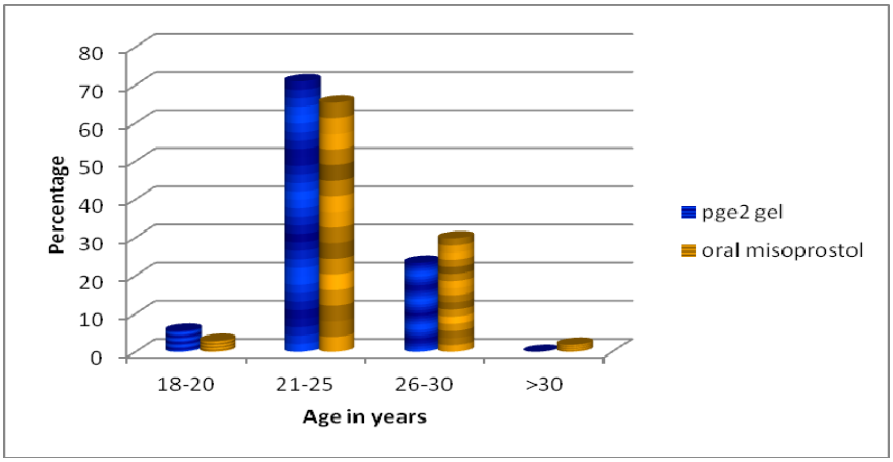


TABLE 2: GESTATIONAL AGE IN WEEKS

GESTATIONAL AGE IN WEEKS	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
37-40	78	72.9	81	77.9
40-42	29	27.1	23	22.1
Total	107	100.0	104	100.0
Mean ± SD	39.34 ± 0.94		39.25 ± 0.97	

Gestational age is both statistically similar with p=0.514

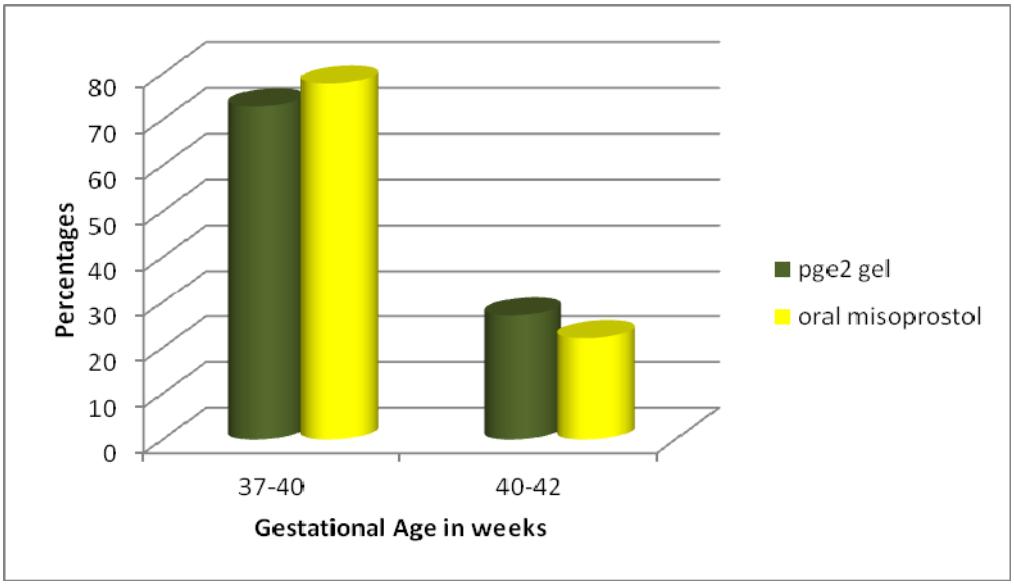
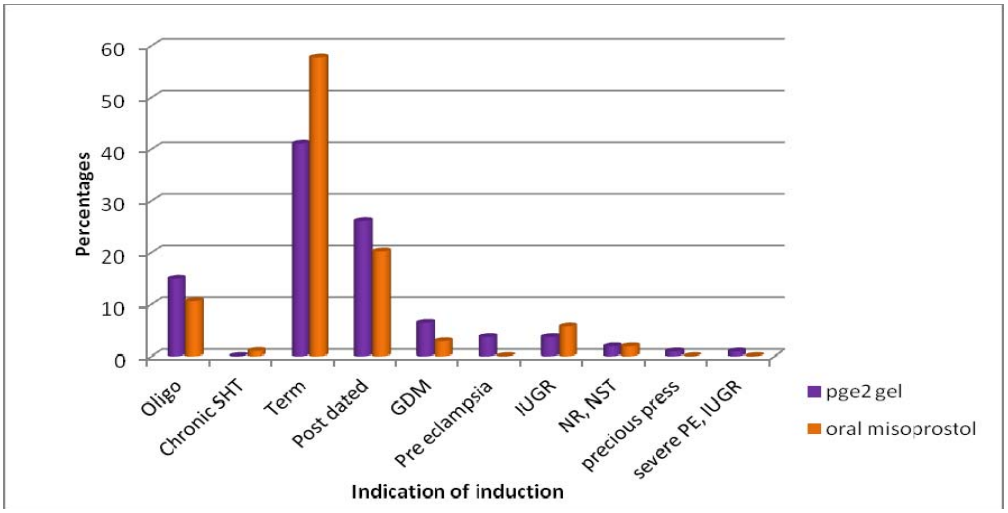


TABLE 3: INDICATION FOR INDUCTION

INDICATION FOR INDUCTION	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
Oligo	16	15.0	11	10.6
Chronic SHT	0	0.0	1	1.0
Term	44	41.1	60	57.7
Post dated	28	26.2	21	20.2
GDM	7	6.5	3	2.9
Pre eclampsia	4	3.7	0	0.0
IUGR	4	3.7	6	5.8
NR, NST	2	1.9	2	1.9
precious pregnancy	1	0.9	0	0.0
severe PE, IUGR	1	0.9	0	0.0



The most common indication is term patients who do not enter into spontaneous labour. The next common indication is post dated pregnancy.

TABLE 5- PRESCORE COMPARISON

PRESCORE	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
0	3	2.8	4	3.8
1	12	11.2	13	12.5
2	32	29.9	32	30.8
3	32	29.9	29	27.9
4	27	25.2	26	25.0
5	1	0.9	0	0.0
Mean ± SD	2.66 ± 1.08		2.57 ± 1.11	
Inference	Prescore does not differ in two groups with P=0.568 and therefore there is no statistical significance			

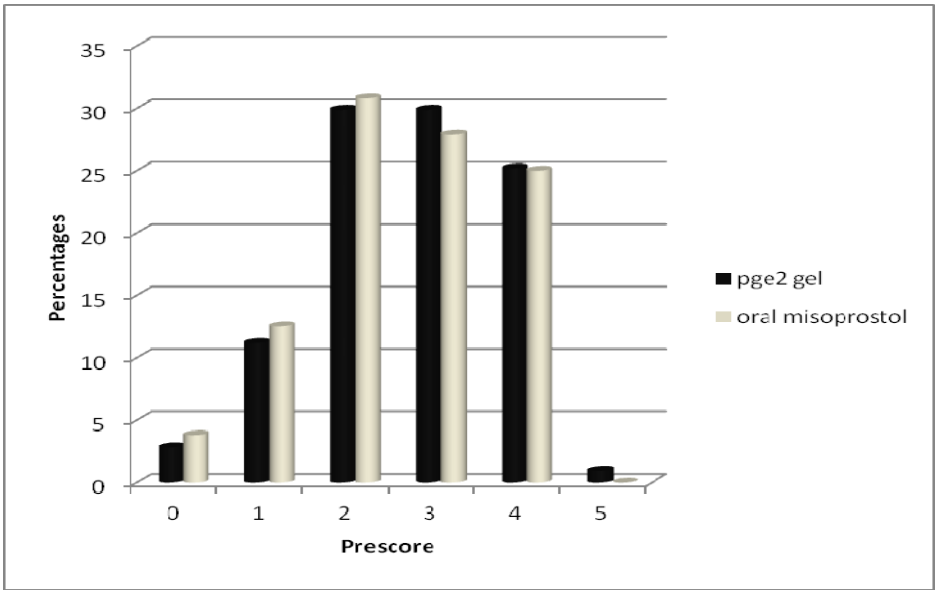


TABLE 6- POSTSCORE COMPARISON

POSTSCORE	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
0-3	4	4.8	11	13.4
4-7	71	66.4	42	40.4
8-10	24	22.4	53	51.0
>10	0	0.0	4	3.8
Mean ± SD	6.0 ± 2.08		7.60 ± 2.09	
Inference	Post score differs in two groups with P=0.000 and therefore there is statistical significance			

Post bishop score of 0-3 is more in oral misoprostol group(13.4%). The improvement in bishop score with 0-3 was less with oral misoprostol and hence the rate of failed induction was high. But the overall improvement in bishop score was better with oral misoprostol.

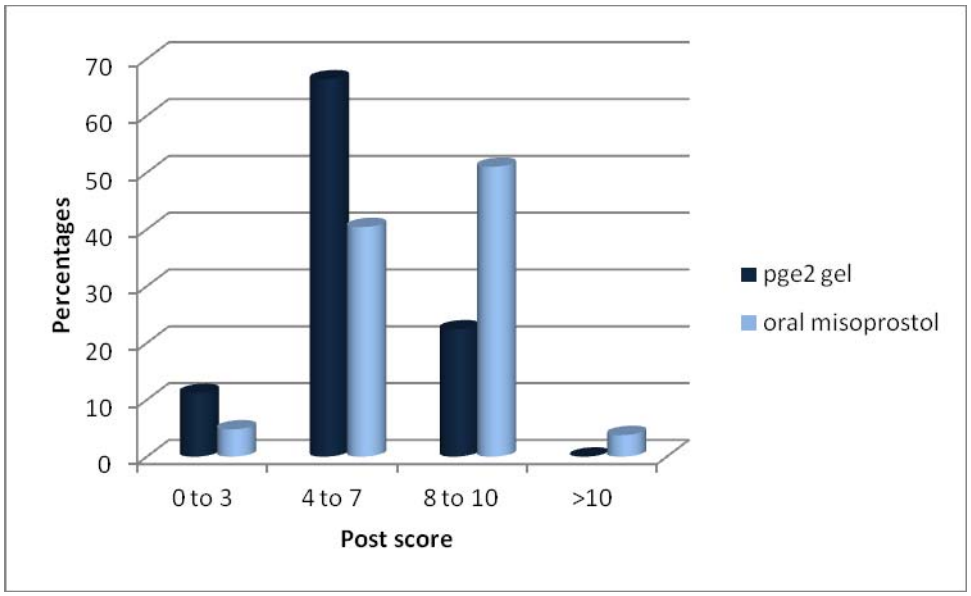


TABLE 7: COMPARATIVE EVALUATION OF INDUCTION SCORE

BISHOP SCORE	**PGE2 GEL**	**ORAL MISOPROSTOL**	P VALUE
Pre Induction score	2.66 ± 1.08	2.57 ± 1.11	0.568
Post Induction Score	6.00 ± 2.08	7.60 ± 2.09	0.000
P value	>0.001	<0.001	

The pre induction score was similar in both the groups with a mean of 2.66 ± 1.08 in PGE2 gel group and 2.57 ± 1.11 in oral misoprostol group. There was a significant change in bishop score in both groups but in oral misoprostol, the cervix once it became favorable it progressed very smoothly with significant difference of p<0.001.

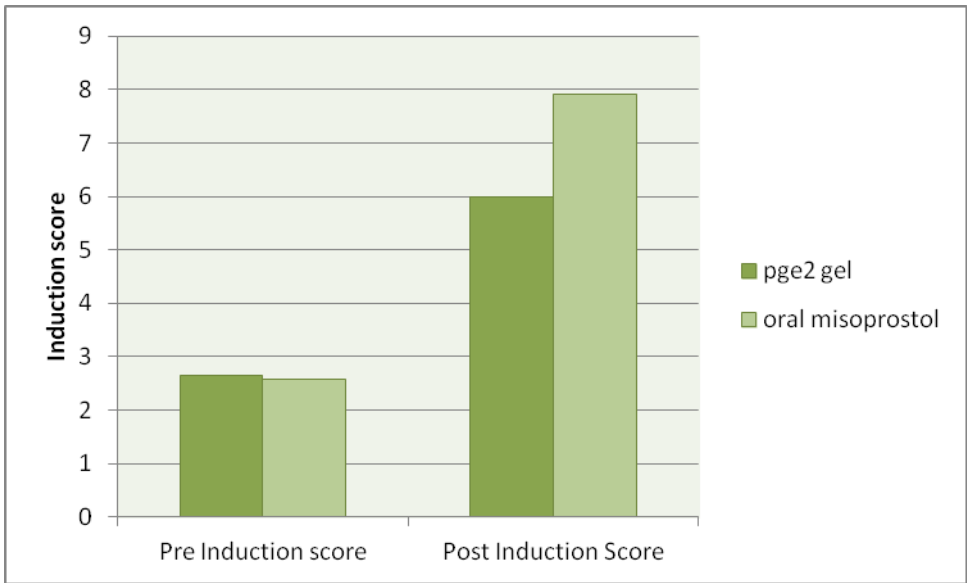


TABLE 8: NO OF DOSES

NO OF DOSES	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
1	32	29.9	20	19.2
2	44	41.1	32	30.8
3	31	29.0	52	50.0
Mean ± SD	1.99 ± 0.77		2.30 ± 0.78	
Inference	Doses are not statistically similar in two groups with P=0.003			

50% of oral misoprostol group needed 3 doses and only 31% PGE2 gel needed 3 doses.

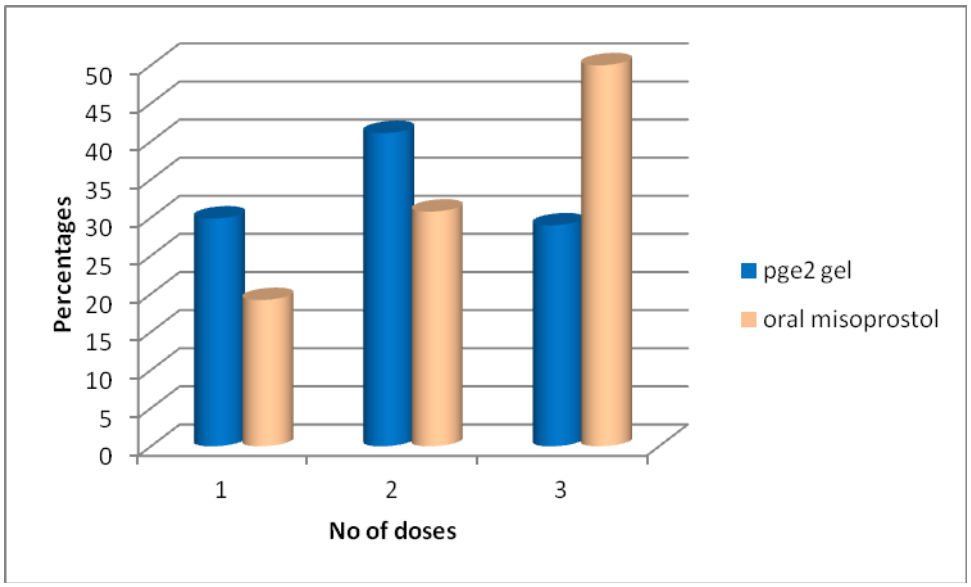


TABLE 9- PRESCORE & NO OF DOSES- PGE2GEL

PRESCORE	1 DOSE		2 DOSE		3 DOSE	
	No	%	No	%	No	%
0	1	33.3	0	0.0	2	66.7
1	0	0.0	6	50.0	6	50.0
2	14	43.8	9	28.1	9	28.1
3	8	25.0	16	50.0	8	25.0
4	9	33.3	12	44.4	6	22.2
5	0	0.0	1	100.0	0	0.0
Inference	P=0.187, there is no statistical significance					

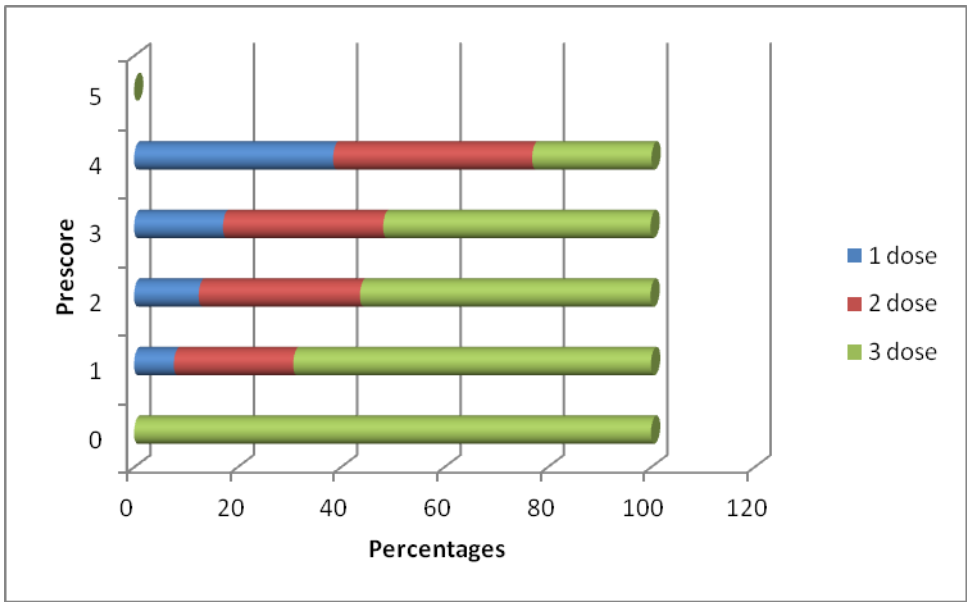


TABLE 10- PRESCORE & NO OF DOSES- ORAL MISOPROSTOL

PRESCORE	1 DOSE		2 DOSE		3 DOSE	
	No	%	No	%	No	%
0	0	0.0	0	0.0	4	100.0
1	1	7.7	3	23.1	9	69.2
2	4	12.5	10	31.2	18	56.2
3	5	17.2	9	31.0	15	51.7
4	10	38.5	10	38.5	6	23.1
5	0	0.0	0	0.0	0	0.0
Inference	P=0.003, there is statistical significance					

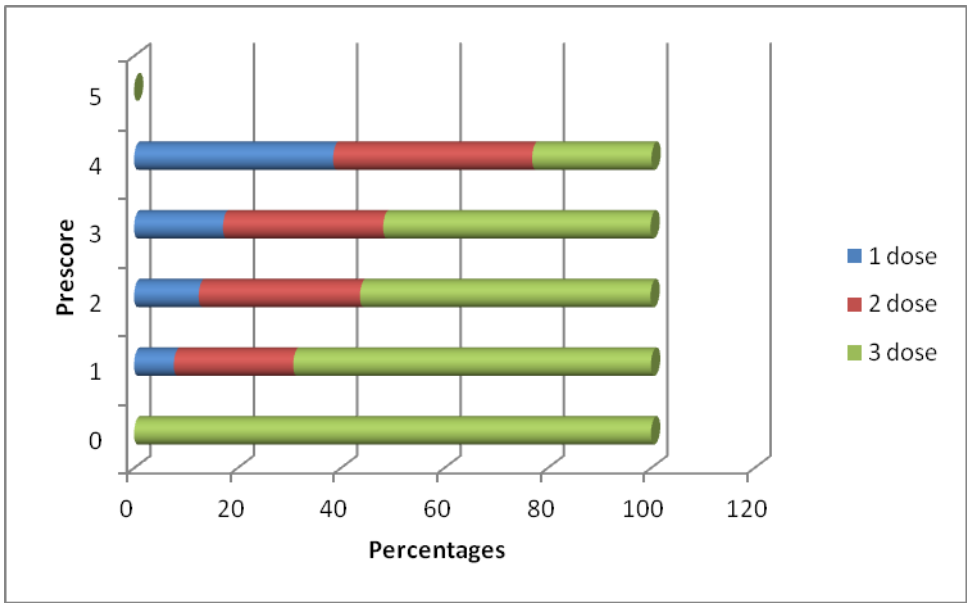


TABLE 11: AUGMENTATION

AUGMENTATION	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
Nil	52	48.6	64	61.5
Cytotec	55	51.4	29	27.9
PGE2Gel	0	0.0	11	10.6
Mean ± SD	1.99 ± 0.77		2.30 ± 0.78	
Inference	Augmentations are statistically similar in two groups with P=0.774. Incase of cytotec and PGE2Gel, there is statistical significance with p values 0.000 and 0.000			

In both the groups, labour was augmented. The need for augmentation was more with PGE2 gel. In oral misoprostol group, 38% needed augmentation of which 11 patient had failed induction and they were induced with PGE2 gel. The need for cytotec augmentation was more with PGE2 gel. 61.5% did not require augmentation in misoprostol group while 48.6 did not require augmentation in PGE2 gel group.

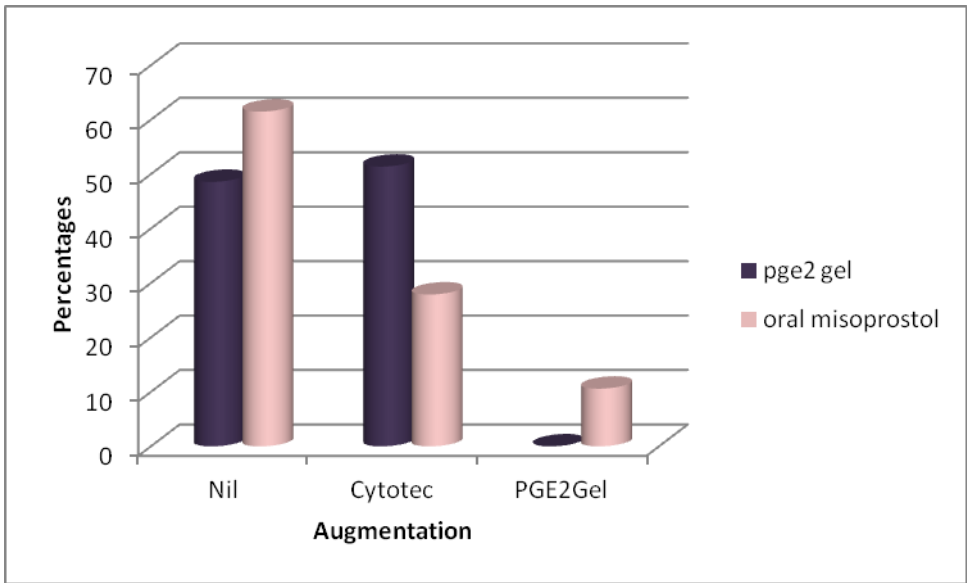
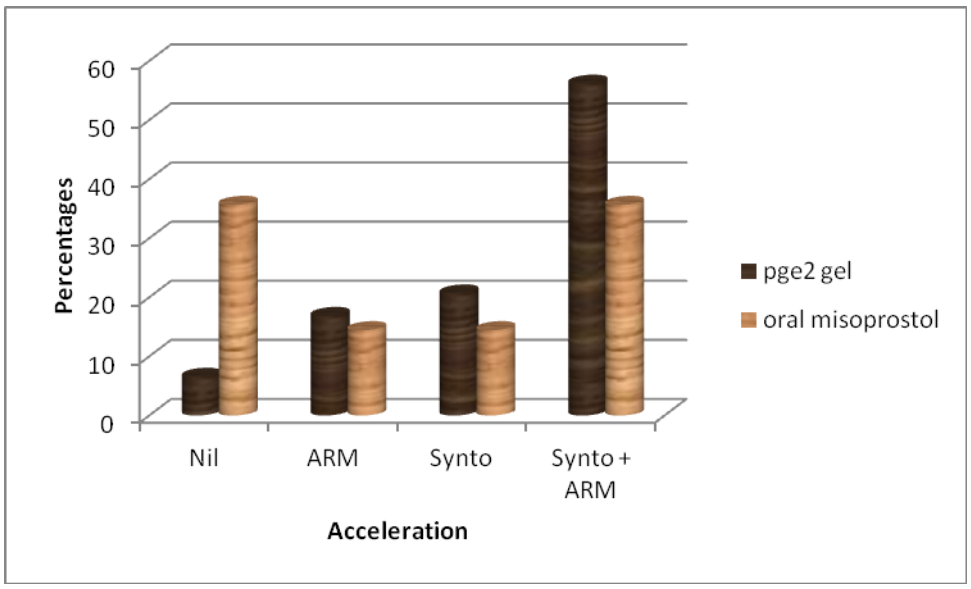


TABLE 12 INDUCTION IF FAILED ORAL MISOPROSTOL:

AUGMENTATION		PGE2 GEL		ORAL MISOPROSTOL	
		No	%	No	%
PGE2Gel	LSCS	0	0.0	10	90.9
	NVD	0	0.0	1	9.1

TABLE 13: ACCELERATION

ACCELERATION	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
Nil	7	6.5	37	35.6
ARM	18	16.8	15	14.4
Synto	22	20.6	15	14.4
Synto + ARM	60	56.1	37	35.6
Total	107	100.0	104	100.0
Inference	Acceleration is not statistically similar in two groups of patients with P=0.000 and therefore there is statistical significance			



37 patients in oral misoprostol did not need acceleration and 93% of PGE2 gel needed acceleration and in that 60% needed both ARM and synto . 64% oral misoprostol needed acceleration and in that only 37% needed acceleration with both ARM and synto.

TABLE 14: MODE OF DELIVERY

MODE OF DELIVERY	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
LSCS	37	34.6	33	31.7
NVD	70	65.4	71	68.3
Total	107	100.0	104	100.0
Inference	Mode of delivery is statistically similar in two groups pf patients with P=0.289			

33 patient had lscs in oral misoprostol but it was not statistically significant. Out of 104 cases 68.% had normal vaginal delivery.

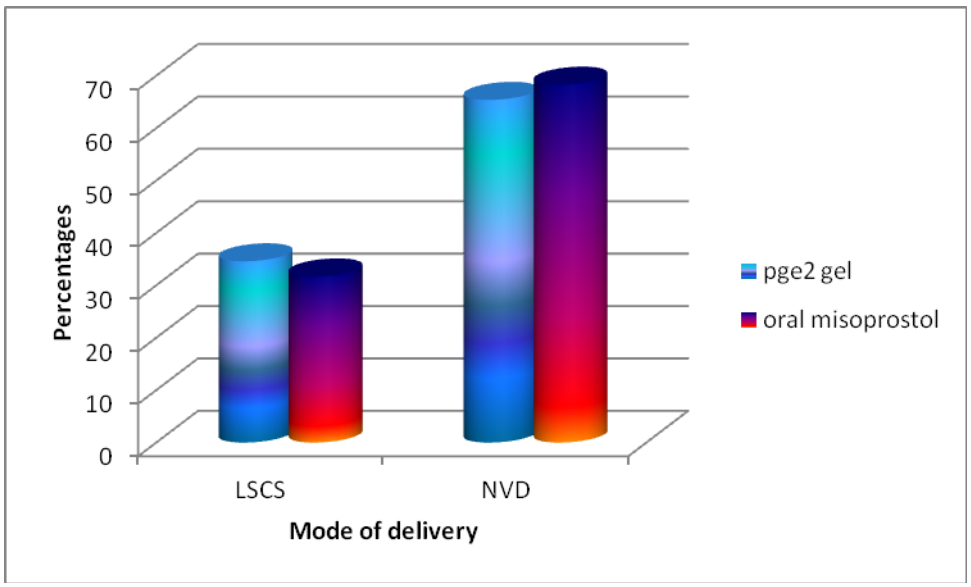


TABLE 15- PRESCORE AND MODE OF DELIVERY- PGE2GEL

PRESCORE	LSCS		NVD	
	No	%	No	%
0	1	33.3	2	66.7
1	6	50.0	6	50.0
2	14	43.8	18	56.2
3	10	31.2	22	68.8
4	6	22.2	21	77.8
5	0	0.0	1	100.0
Inference	P=0.433, there is no statistical significance			

50% with score 1 had lscs and 77% with score 4 had vaginal delivery.

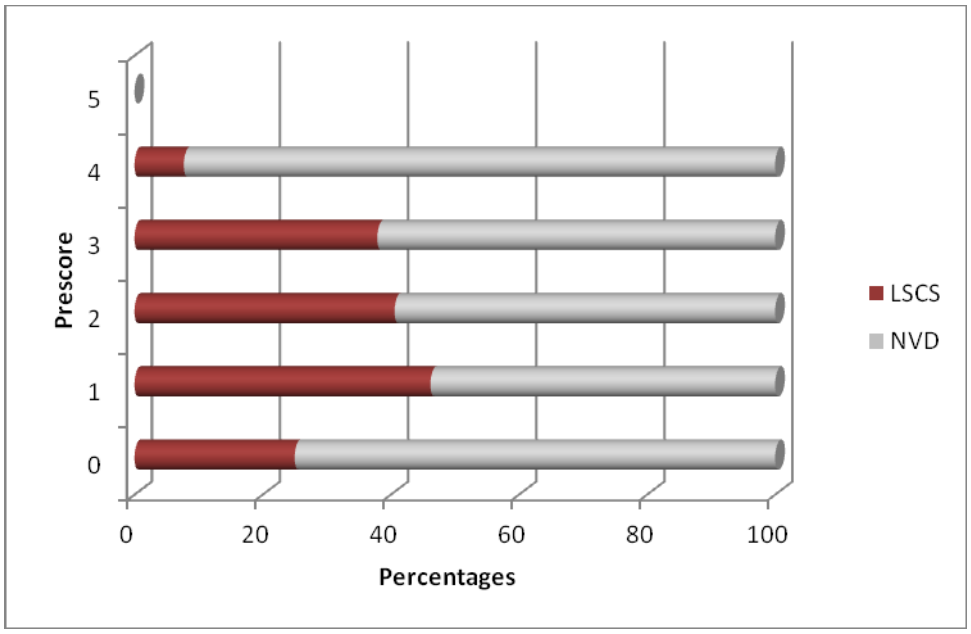


TABLE 16- PRESCORE AND MODE OF DELIVERY- ORAL MISOPROSTOL

PRESCORE	LSCS		NVD	
	No	%	No	%
0	1	25.0	3	75.0
1	6	46.2	7	53.8
2	13	40.6	19	59.4
3	11	37.9	18	62.1
4	2	7.7	24	92.3
5	0	0.0	0	0.0
Inference	P=0.039, there is statistical significance			

46% with score 1 underwent lscs and 92% with score 4 had vaginal delivery

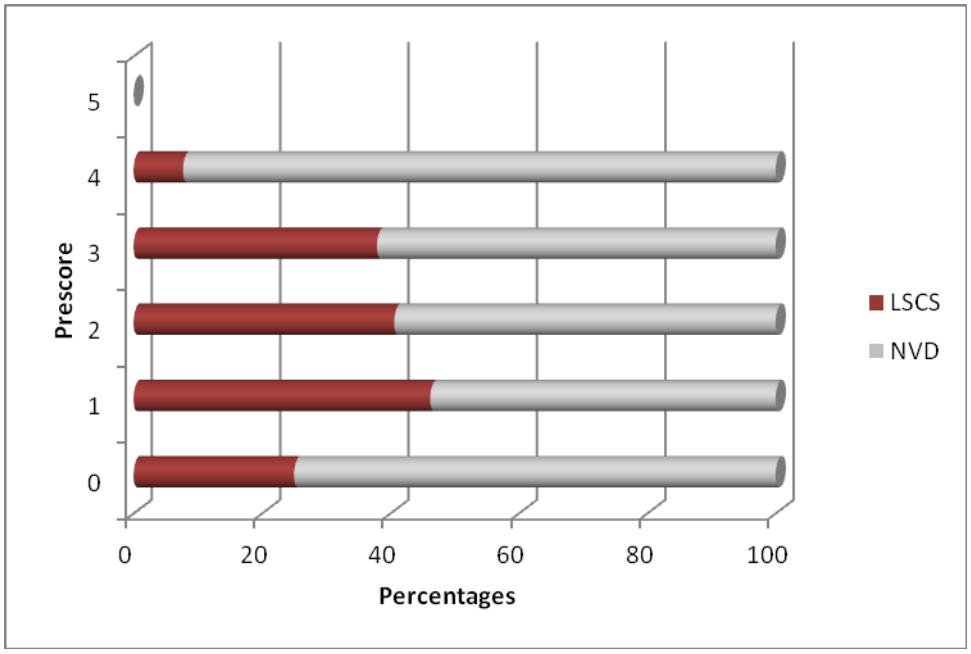


TABLE 17: INDICATION FOR LSCS

INDICATION FOR LSCS	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
Fetal distress	23	62.2	14	42.4
Failed Induction	5	13.5	11	39.4
Non progression of labour	9	24.3	6	18.2
Inference	Indication of LSCS is statistically similar in two groups with p= 0.486 and therefore there is no statistical significance. In case of fetal distress, failed induction and non progression of labour, there is no statistical significance with the p values of 0.126, 0.098 and 0.579			

The most common indication for LSCS was fetal distress in both the groups. Failed induction was comparatively more with oral misoprostol but it was not statistically significant.

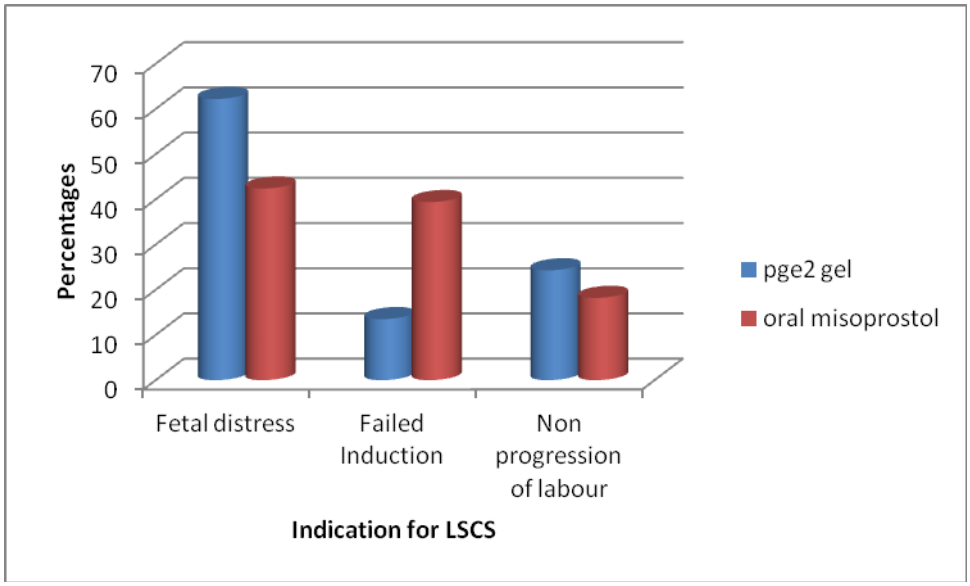


TABLE 18: INDUCTION DELIVERY INTERVAL

INTERVAL (HRS)	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
<12 hours	15	14.0	21	20.2
12-24 hours	48	44.9	41	39.4
24-36 hours	28	26.2	22	21.2
36-48 hours	14	13.1	11	10.6
>48 hours	2	1.9	9	8.7
Mean ± SD	23.57 ± 11.90		25.15 ± 13.95	
Inference	Delivery interval (>48 hours) is statistically similar in two groups with p=0.141 and therefore there is no statistical significance.			

The mean duration of induction to delivery is more with oral misoprostol (25.15 ± 13.95) and mean duration in PGE2gel(23.57 ± 11.90). But 21 of oral misoprostol had significantly shorter duration interval in comparison to 15 in PGE2 gel. In oral misoprostol 8.7% had interval more than 48 hours in contrast to 1.9% in PGE2 gel but it was not statistically significant.

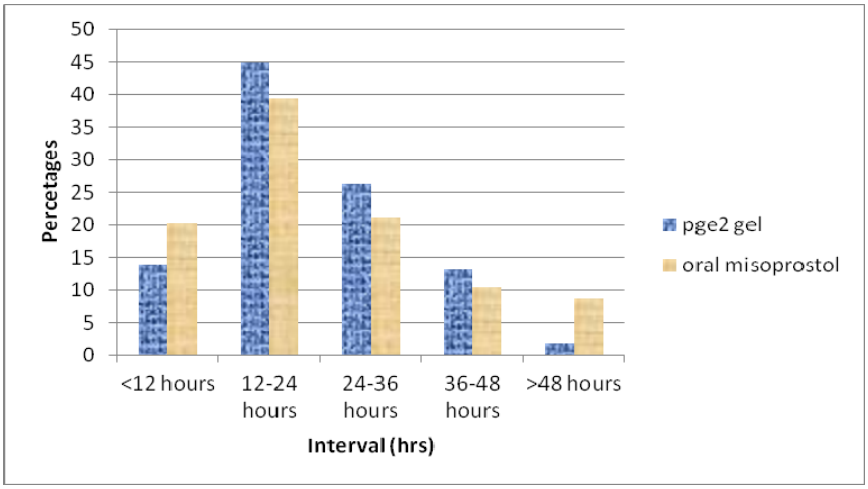


TABLE 19:

Interval (hrs)		pge2 gel		oral misoprostol	
		No	**%**	**No**	**%**
>48 hours	LSCS	2	100.0	6	66.7
	NVD	0	0.0	3	33.3

In those with more than 48 hrs interval 66% had lscs and 33% had vaginal delivery

TABLE 20: COMPLICATIONS

COMPLICATIONS		PGE2 GEL		ORAL MISOPROSTOL	
		No	**%**	**No**	**%**
Normal		59	55.1	76	73.1
Abnormal	Fetal distress	43	40.2	25	24.0
	Fever	1	0.9	3	2.9
	Hyperstimulation	4	3.7	0	0.0
	Inference	Incidence of complications are not statistically similar in two groups of patients studied with P=0.005			

Incidence of complication is less in oral misoprostol (26.9%). Among them 25% had fetal distress and none had hyperstimulation. In contrast PGE2 gel 44.8% had complication and in them 43% had fetal distress and 4% had hyperstimulation.

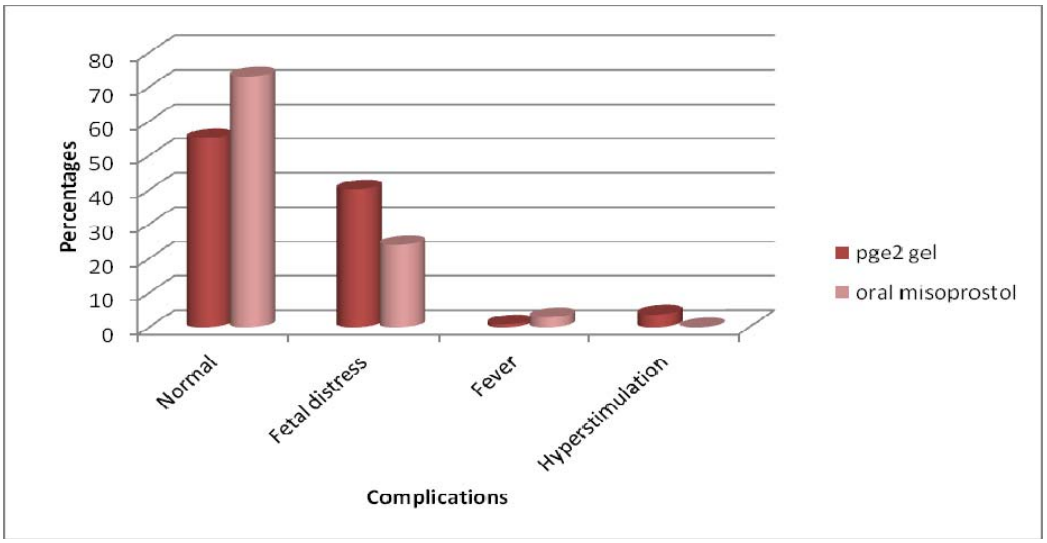
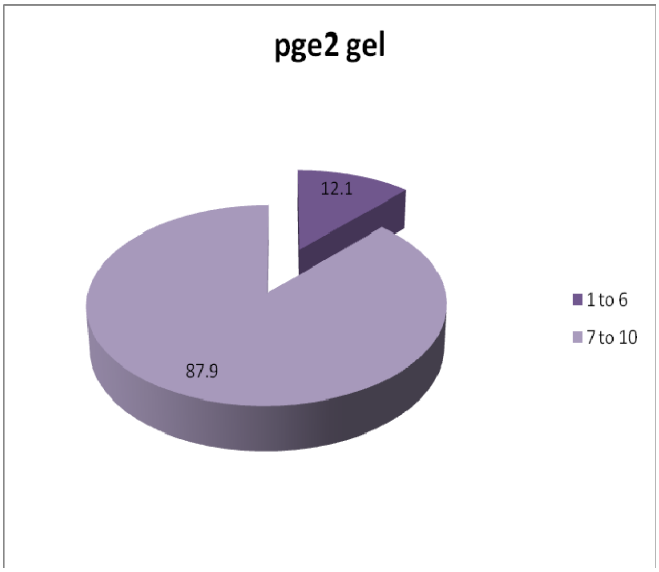


TABLE 21: APGAR SCORE 1 MINUTE

APGAR SCORE AT 1 MINUTE	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
1 -6	13	12.1	10	9.6
7 -10	94	87.9	94	90.4
Mean ± SD	7.47 ± 0.98		7.50 ± 1.09	
Inference	Incidence of low Apgar score is statistically similar in two groups with P=0.871			

Statistically similar apgar score was obtained in both the groups. No NICU admission and neonatal death was noted.



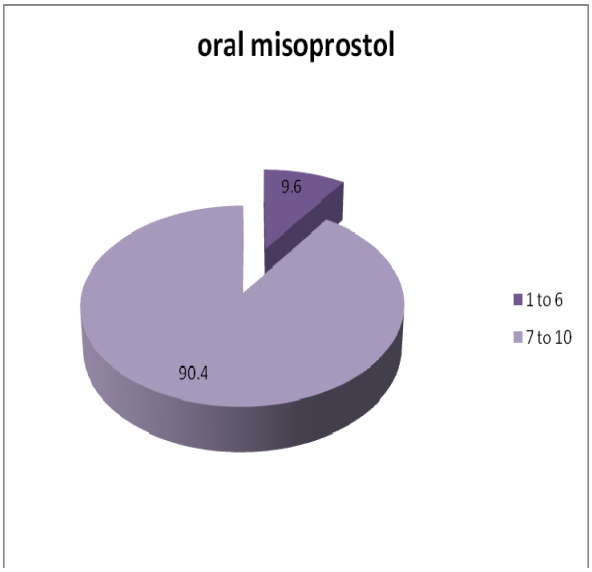
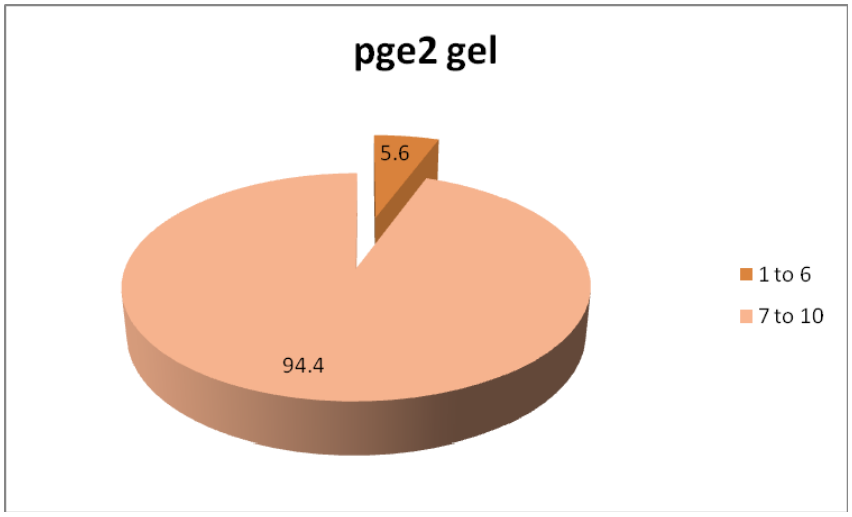


Table 22: Apgar score 5 minute

APGAR SCORE AT 5 MINUTE	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
1-6	6	5.6	2	1.9
7-10	101	94.4	102	98.1
Mean ± SD	8.55 ± 0.84		8.59 ± 0.87	
Inference	Incidence of low Apgar score at 5 minutes is statistically similar in two groups with P=0.707			



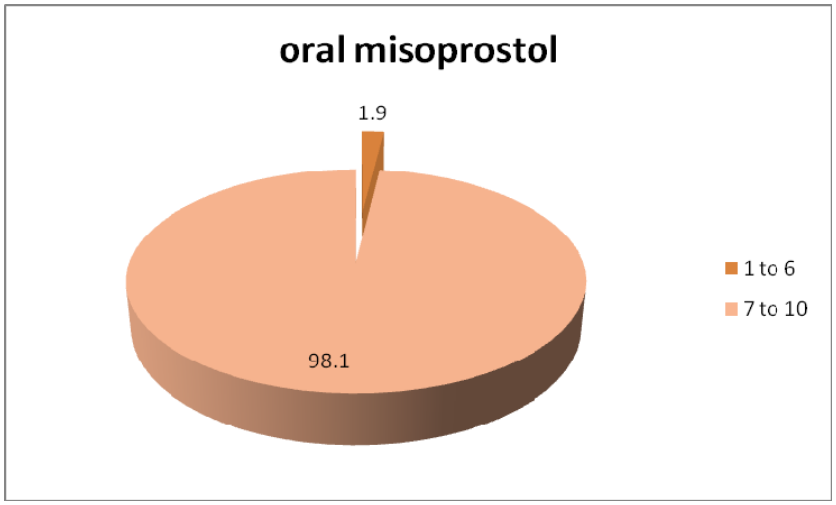


TABLE 23: POST NATAL COMPLICATIONS

POST NATAL COMPLICATIONS	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
Nil	103	96.3	100	96.2
PPH	3	2.8	2	1.9
Retained placenta	1	0.9	0	0.0
Perineal tear	0	0.0	2	1.9
Inference	Incidence of post natal complications are statistically similar in two groups of patients studied with P=0.536			

1.9% had complete perineal tear and 1% had retained placenta in PGE2 gel but post natal complication was statistically insignificant in both groups

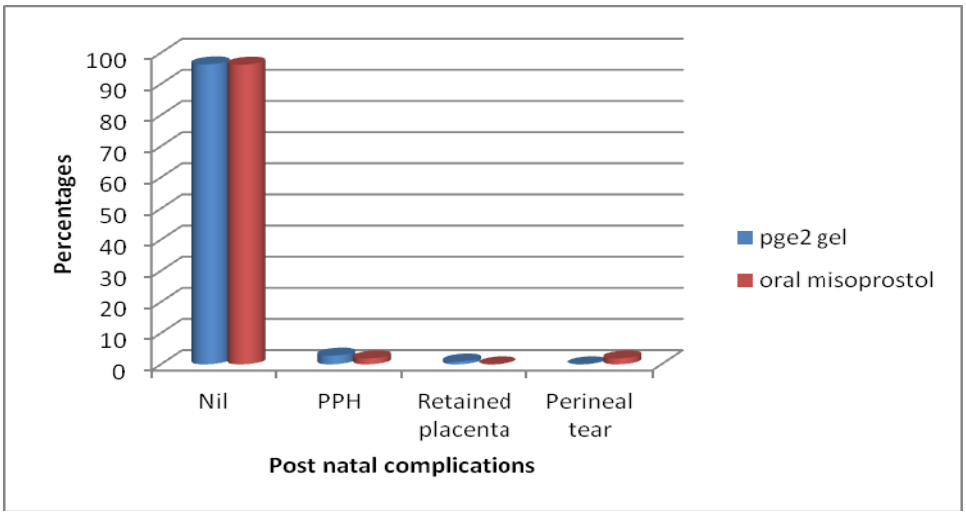
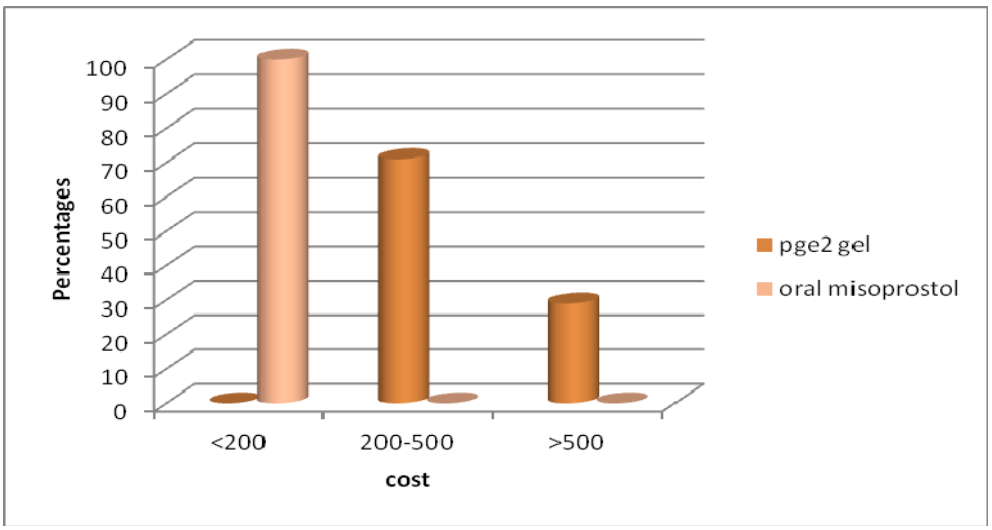


TABLE 24 –COST OF INDUCTION

COST	PGE2 GEL		ORAL MISOPROSTOL	
	No	%	No	%
<200	0	0.0	104	100.0
200-500	76	71.0	0	0.0
>500	31	29.0	0	0.0
Mean ± SD	443.69 ± 176.07		9.2 ± 3.1	
Inference	costs are not statistically similar in two groups with P=0.000			

The mean cost of induction in oral misoprostol is Rs.9 and in PGE2 gel is Rs.450. This is 50 times more than the amount used for oral misoprostol. Hence oral misoprostol is better cost effective than PGE2 gel



Discussion

DISCUSSION

Ian Donald defined induced labour is “the one in which pregnancy is terminated artificially anytime after the period of viability by a method which aims to secure delivery via naturalis.” Williams states that induction of labour implies stimulation of uterine contraction before spontaneous onset of labour with or without rupture membrane.

INDICATIONS FOR INDUCTION (ACOG technical bulletin 157,1991)

1. gestational hypertension
2. PROM
3. abruption placentae
4. chorioamnionitis
5. suspected
    - Absence of fetal well being
    - IUGR
    - Post term pregnancy
    - Isoimmunisation
6. maternal medical problems
7. fetal demise

CONTRAINDICATION FOR INDUCTION(ACOG bulletin 157,1991)

1) Major degree of cephalopelvic disproportion
2) Placenta previa
3) classical caesarean section
4) Cord presentation
5) Prior myomectomy or uterine unification surgery
6) Active genital herpes infection
7) Pregnancy following VVF repair
8) Malpresentation
9) Invasive cervical carcinoma

RISKS OF INDUCTION:

A. MATERNAL:

1. Psychological upset
2. Need for emergency caesarean delivery
    - Fetal distress
    - Failed induction
3. Placental abruption
4. Precipitate delivery
5. Abnormal uterine action

6. Atony of uterus
7. Water intoxication and electrolyte imbalance
8. Infection
9. Amniotic fluid embolism

B. FETAL

1. Iatrogenic prematurity
2. Fetal hypoxia
3. Neonatal jaundice in association with oxytocin

FACTORS TO BE CONSIDERED WHEN ELECTING TO INDUCE ARE:

1. Patients informed consent
2. Estimation of fetal pulmonary maturity
3. Estimation of gestational age
4. Pelvic adequacy
5. Readiness of cervix
6. Bishop scoring system
7. Stability of maternal condition
8. Uterine integrity

METHODS OF INDUCTION IN RELATION TO STATE OF CERVIX:

	CERVICAL STATE		**INDUCTION METHODS**	
1.	Unfavourable cervix(nulliparous score <5)	Medical	1.myometrial stimulants 2.cervcial modifying drugs	a. Prostaglandins b.oxytocin a. Prostaglandins b.estrogens c.relaxins d.DHEA e.Antiprogestins
		mechanical	1.bougies 2.hygroscopic tents 3.catheters and balloons	
2.	Moderately favourable cervix(all multiparous and nulliparous 5-8)	Mechanical	1.aminotomy	
		Medical	1.oxytocin 2.prostaglandins	
3.	Favourable cervix(>8)	Mechanical	1.sweep and stretch 2.amniotomy	

CLINICAL RECOMMENDATIONS FOR INDUCTION OF LABOUR(ACOG):

Specific clinical recommendations and conclusions, all based on good and consistent scientific evidence(level A),are as follows:

1. For cervical ripening and labour induction, prostaglandin E analogues are effective.
2. When labour induction is indicated, low dose or high dose oxytocin regimens are appropriate.
3. Regardless of Bishop score, the most efficient method of labour induction before 28 weeks of gestation appears to be vaginal misoprostol.However, infusion of high dose oxytocin is also an acceptable option.
4. For cervical ripening and induction of labour, an appropriate initial dose of misoprostol is approximately 25microgms,with frequency of administration not to exceed 1 dose every 3-6 hours
5. In women with previous caesarean delivery or major uterine surgery, the use of misoprostol should be avoided in the third trimester because it has been linked to a greater risk for uterine rupture.

Prostaglandin gel has been used for cervical ripening for a very long period of time. The PGE2 gel as a mode of induction is time tested and research proven. The dose of 0.5mg has been the standard. Over a period of time the advantages and disadvantages of PGE2 gel by improving the cervical scoring range from 3 to 7 points[80,81]. There are also studies that has shown that PGE2 gel has shorter induction delivery interval(23) and the need for acceleration and augmentation is also less(28). PGE2 gel major disadvantage is that it has high incidence of hyperstimulation(34). PGE2 gel has been approved by FDA in the induction of labour.

Misoprostol is a synthetic analogue which is not approved by FDA for induction and cervical ripening but American college of obstetrics and gynecology advocates misoprostol and it is on WHO essential drug list for labour induction(26). Initially approved for prevention and treatment of gastric ulcer associated with use of non steroidal anti inflammatory drugs. Exogenously administered prostaglandins are relatively newer prostaglandins used for induction of labour. Initially PGE2 gel was used intracervically due to high cost and cold storage problems and so now is being replaced by newer PGE1 tablets for effective and safe induction. Misoprostol tablets acts as effective myometrial stimulants, is quiet stable in vivo and is rapidly absorbed orally and vaginally. Well controlled studies indicates its

efficacy via oral route[27]. Misoprostol is rapidly absorbed orally[4] and, although not formulated for parenteral use, can also be administered sublingually[5], rectally[6], and vaginally. It is compared to other preparations of prostaglandins and does not require refrigerated transport or storage[28]. It has the potential for providing increased patient satisfaction because of its noninvasive route of administration. Moreover, the possibility of misplacement is eliminated, These characteristics make it particularly suitable for use in developing countries. Because of its uterotonic and cervical ripening activity, wide- ranging off-label uses have been introduced for misoprostol[29]

In this study comprising of 211 antenatal mothers, 104 mothers received oral misoprostol 25 microgm and 107 mothers received prostaglandin E2 gel 0.5mg as a mode of induction and their efficacy in cervical ripening and induction of labour was compared. The secondary outcomes like change in bishop score ,time interval from induction to onset of adequate uterine contraction, the need for augmentation of labour, mode of delivery, side effects, patient satisfaction and cost of induction and neonatal outcome were also compared.

Misoprostol has been the subject of numerous recent articles describing its use as a cervical ripening agent. Doses of 25 to 50

microgram administered orally have been shown to be effective in inducing labour and cervical ripening[50]. Tabor et al have shown that it is an effective agent for cervical ripening and labour induction in patients with viable pregnancies. In this study the most common indication was term patients who did not enter into spontaneous labour followed by post dated post dated pregnancy. Ngai et al did a double blind randomised trial with 200 microgm of oral misoprostol who showed that even though bishop score improved very significantly with such high dose, the incidence of uterine rupture was also present [33]. Cheng SY et al showed that inorder to avoid hyperstimulation, current suggestion are in favour of oral misoprostol given in small frequent dose[36]. The same suggestion was given by shazia syed et al[45] and kundodyiwa TW et al[46]. In a trial conducted in Bahawal Victoria hospital where multiparous women were induced with 50 microgm oral misoprostol and the incidence of hyperstimulation was around 9%[57]. In a Cochrane review it seems that though high dose(100 microgm) are more effective , with more successful vaginal deliveries within 24 hrs, however stronger uterine contractions and shorter labour duration have to be carefully balanced against more uterine hyperstimulation, adverse neonatal outcomes and possibility of uterine rupture. ACOG committe also emphasizes that 25 microgm should be considered as an initial dose in inducing labour in third

trimester to minimise the risk of hyperstimulation and uterine rupture and it should not be administered more frequently than every 3-6 hours[59]. The dose in this study used was 25 microgm used every 6 hours (max dose:75 microgm) inorder to avoid the complication of high dose. There was no hyperstimulation and uterine rupture in this study.

In both the groups the preinduction score taken was <5 and it was statistically similar. There was significant change in bishop score in both the groups but in oral misoprostol the cervix once it became very favourable it progressed very quickly with a significant difference of $p<0.001$. If the preinduction score was very less the number of doses required for induction was more in both the groups. In comparing the post bishop score among the two groups, improvement in bishop score especially with prescore ranging from 0-3 is better with PGE2 gel when compared to oral misoprostol(post score 0-3, 13.4% in oral misoprostol Vs 4.8% in PGE2 gel). This implies that PGE2 gel would be a better mode of induction with a very unfavourable cervix.

Many studies have show that oral misoprostol when compared to dinoprostone gel is associated with low incidence of caesarean section. In Nigam's(200 microgm single dose) , Dallen's(50 microgm) and Dodd's(25 microgm) studies this rate was 22.7%,1.8% and

8.3%respectively [42]. In this study the incidence of cesarean section was 31.7% oral misoprostol Vs 34.6% in PGE2 gel but it was not statistically significant. Shazia syed et al, Sanchez Ramos et al showed statistically insignificant incidence in both the groups. The most common indication for caesarean section in this study was fetal distress(42.4% in oral misoprostol).

There were five studies comparing low dose oral misoprostol (25 mcg) with dinoprostone gel which showed that the need for augmentation with oxytocin was similar in both the groups[62].In this study both the groups labour was augmented. The need for augmentation was more with PGE2 gel especially with vaginal misoprostol. In oral misoprostol group only 38% needed augmentation and among them 39.4% had failed induction and those people were again induced with PGE2 gel(51%). Among those who were reinduced with PGE2 gel only 1 patient delivered vaginally and rest underwent caesarean section. From this we assume that if the cervix becomes favourable with oral misoprostol they progress without any difficulty but if they don't even if other methods are used they do not respond. 37 pateints in oral misoprostol group did not need acceleration and 100 pateints in PGE2 gel group needed acceleration and in that 60% needed both synto and artificial rupture of membrane. 64%

oral misoprostol group needed acceleration and in that only 37% needed acceleration with both synto and ARM.

Abbassi's study with low total dose of 150 microgm the induction delivery interval was shorter (mean 6.7+/- 4.4 hrs)(40). Dodd et al showed that with very low dose vaginal birth was not achieved within 24 hours in comparison to dinoprostone 0.5mg gel[42]. Sanchez ramos in his study comparing oral misoprostol 25mcg with vaginal dinoprostone gel 0.5 mg showed shorter induction delivery interval with oral misoprostol with mean duration being 12-24hrs. Wing et al showed that with low dose of 25mcg the induction delivery interval will be longer in contrast to 50 mcg[38,61]. WHO analysis[64] reviewing 10 trials also concluded that there is no significant difference in induction delivery interval between oral misoprostol and dinoprostone gel. The mean induction delivery interval is more with oral misoprostol. But 20 patient in oral misoprostol group had relatively shorter duration in contrast to 15 patients in PGE2 gel. Though 8.7% in oral misoprostol had interval >48hrs in contrast to PGE2 1.9% it was not statistically significant. In oral misoprostol group with duration more than 48 hours most of them delivered only by caesarean section.

Dodd's and Khatri's study the incidence of meconium stained liquor was 16.2% and 12%[43]. Dodd et al showed that the incidence of fetal distress (8.8% 25mcg misoprostol Vs 9.3 % in dinoprostone gel) and incidence of hyperstimulation (0.8% 25mcg misoprostol Vs 1.6 % in dinoprostone gel). Snachez Ramos showed that those who received misoprostol were twice likely to experience hyperstimulation and tachysystole [56]. Low dose oral misoprostol in comparison with vaginal misoprostol was associated with less risk of hyperstimulation (2%Vs13%). In a randomised trial conducted in Adelaide university showed that there is no significant difference in incidence of hyperstimulation and fetal distress in patients induced with oral misoprostol and dinoprostone gel [42]. Langennegger et al [67] showed that there is no significant difference in frequency of fetal heart rate abnormalitie between oral misoprostol 50 mcg Vs dinoprostone 0.5mg.In this study Incidence of complication is less in oral misoprostol 26.9%. among them only 25% had fetal distress and none had hyperstimulation. In PGE2 gel group 44.8% had complication and in them 43% had fetal distress and 4% had hyperstimulation. But overall the incidence of complication in both the groups are not statistically similar.

The incidence of meconium aspiration syndrome in study by Shazia Syed et al was 10.8% and 95% had good apgar score. In trial conducted with 50mcg oral misoprostol versus vaginal misoprostol the incidence of neonatal admission was more with oral misoprostol(12%Vs4%). Wing et al (38) showed that the neonatal admission was not significant between 25 and 50 mcg oral misoprostol. In this study the apgar score assessed at 1 minute and 5 minute was statistically insignificant. No respiratory distress, NICU admission and neonatal death is noted in both the groups.

The other complication like fever, vomiting and gastrointestinal disturbance was more with oral misoprostol than with dinoprostone gel as seen from this study. The incidence of post natal complication like complete perineal tear and retained placenta was statistically insignificant.

Women's satisfaction with oral misoprostol was assessed formally in only one study[42] and more than half the women expressed a preference for oral induction agent. The cost of induction inferred from this study is that the amount needed for induction with PGE2 gel was

almost 10 times more than that needed for oral misoprostol. All these advantages makes oral misoprostol a better induction agent.

Conclusion

CONCLUSION

- In our study, 217 singleton primigravida who consented for the study and in whom cervical ripening and labour induction was indicated were studied. 104 women received misoprostol 25microgm oral and 107 women received dinoprostone gel 0.5mg intracervically.
- The overall improvement in bishop score was better with oral misoprostol.
- There was a significant change in bishop score in both groups but in oral misoprostol, the cervix once it became favourable it progressed very smoothly.
- The need for augmentation with vaginal misoprostol is less with oral misoprostol (27.9%) when compared to PGE2 gel (51.4%).
- 35.6% of oral misoprostol did not need acceleration when compared to PGE2 gel 6.5%.
- In those who needed acceleration with both oxytocin and ARM was less with oral misoprostol 35.6% when compared to PGE2 gel 56.1%.
- The incidence of LSCS in oral misoprostol 31.7% when compared to PGE2 gel 34.6%.

- 20.2% had induction delivery interval less than 12 hrs when compared to PGE2 gel 14.0%
- Incidence of complication is less in oral misoprostol (26.9%). 25% had fetal distress and none had hyperstimulation in oral misoprostol where as PGE2 gel 43% had fetal distress and 4% had hyperstimulation.
- There were no NICU admission and neonatal asphyxia in both the groups.
- The incidence of complication was not statistically significant between the two groups, but the incidence of hyperstimulation was present only with PGE2 gel.
- Both group ‘s satisfaction were assessed and they expressed a preference to oral misoprostol because of its ease of administration and cost effectiveness.
- Post induction bishop score of 0-3 is more in oral misoprostol (13.4%) post induction score of 0-3 in PGE2 is less when compared. (4.8%)
- This shows that with very unfavourable cervix PGE2 gel is a better method of induction when compared to oral misoprostol.
- The induction delivery interval was > 48 hours in .8.7% in oral misoprostol and 1.9% in PGE2 gel delivered by cesaerean section.

In case of prolonged labor with failed induction, other modes of induction also failed to improve the bishop score.

- The number of doses needed for augmentation is more with oral misoprostol because of difference in the route of administration and bio availability of the drugs.

Hereby we conclude saying oral misoprostol is as efficacious as PGE2 gel in induction of labor.

Statistical Methods

STATISTICAL METHODS

Descriptive and inferential statistical analysis has been carried out in the present study. Results on continuous measurements are presented on Mean ± SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. The following assumptions on data is made, Assumptions: 1.Dependent variables should be normally distributed, 2.Samples drawn from the population should be random, Cases of the samples should be independent

Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups Inter group analysis) on metric parameters. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

Significant figures

+ Suggestive significance (P value: $0.05<P<0.10$)

* Moderately significant (P value:$0.01<P \leq 0.05$)

** Strongly significant (P value : $P \leq 0.01$)

Statistical software: The Statistical software namely SAS 9.2, SPSS 15.0, Stata 10.1, MedCalc 9.0.1 ,Systat 12.0 and R environment

ver.2.11.1 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc**.**

Appendix

PSG Institute of Medical Sciences & Research
Institutional Human Ethics Committee

POST BOX NO. 1674, PEELAMEDU, COIMBATORE 641 004, TAMIL NADU, INDIA
Phone : 91 422 - 2598822, 2570170, Fax : 91 422 - 2594400, Email : psgethics2005@yahoo.co.in

Proposal Number	:	**12/018**
Project Title	:	**A comparison study of safety and efficacy of oral misoprostol (50 mcg) with dinioprostone gel (0.5 mcg) for cervical ripening and induction of labour**
Investigator(s)	:	**Dr R Meenakshi Priya**
Institution	:	**PSGIMS & R**
Name of the Guide(s)	:	**Dr T V Chitra**
Institution	:	**PSGIMS & R**
Waiver of Consent	:	**No**
Review Type	:	**Exempt**
Date of the Meeting	:	**N/A**
Decision	:	**Approved**
Approval Date	:	**03.05.2012**
Validity of the Approval	:	**One year**

Approval for this study is given under the following terms and conditions:

1. Non-adherence to the Standard Operating Procedures (SOP) of the Institutional Human Ethics Committee (IHEC) and national and international ethical guidelines shall result in withdrawal of approval (suspension or termination of the study). SOP will be revised from time to time and revisions are applicable prospectively to ongoing studies approved prior to such revisions.

2. PIs are required to send progress reports (in the form of an extended abstract with publications if any) to the IHEC every six months (and a month before expiry of approval date, if renewal of approval is being sought).

3. Request for renewal must be made at least a month ahead of the expiry of validity along with a copy of the progress report.

03/05/2012

Dr Y S Sivan
Member - Secretary

SECRETARY
PSG IMS & R
COIMBATORE-641 004
INSTITUTIONAL HUMAN ETHICS COMMITTEE

PSG Institute of Medical Sciences & Research
Institutional Human Ethics Committee
POST BOX NO. 1674, PEELAMEDU, COIMBATORE 641 004, TAMIL NADU, INDIA
Phone : 91 422 - 2598822, 2570170, Fax : 91 422 - 2594400, Email : psgethics2005@yahoo.co.in

August 14, 2012

Dr R Meenakshi Priya
Post Graduate – Obstetrics & Gynaecology
PSG IMS & R
Coimbatore

Ref.: Your letter regarding the change in dose

Dear Dr Meenakshi Priya,

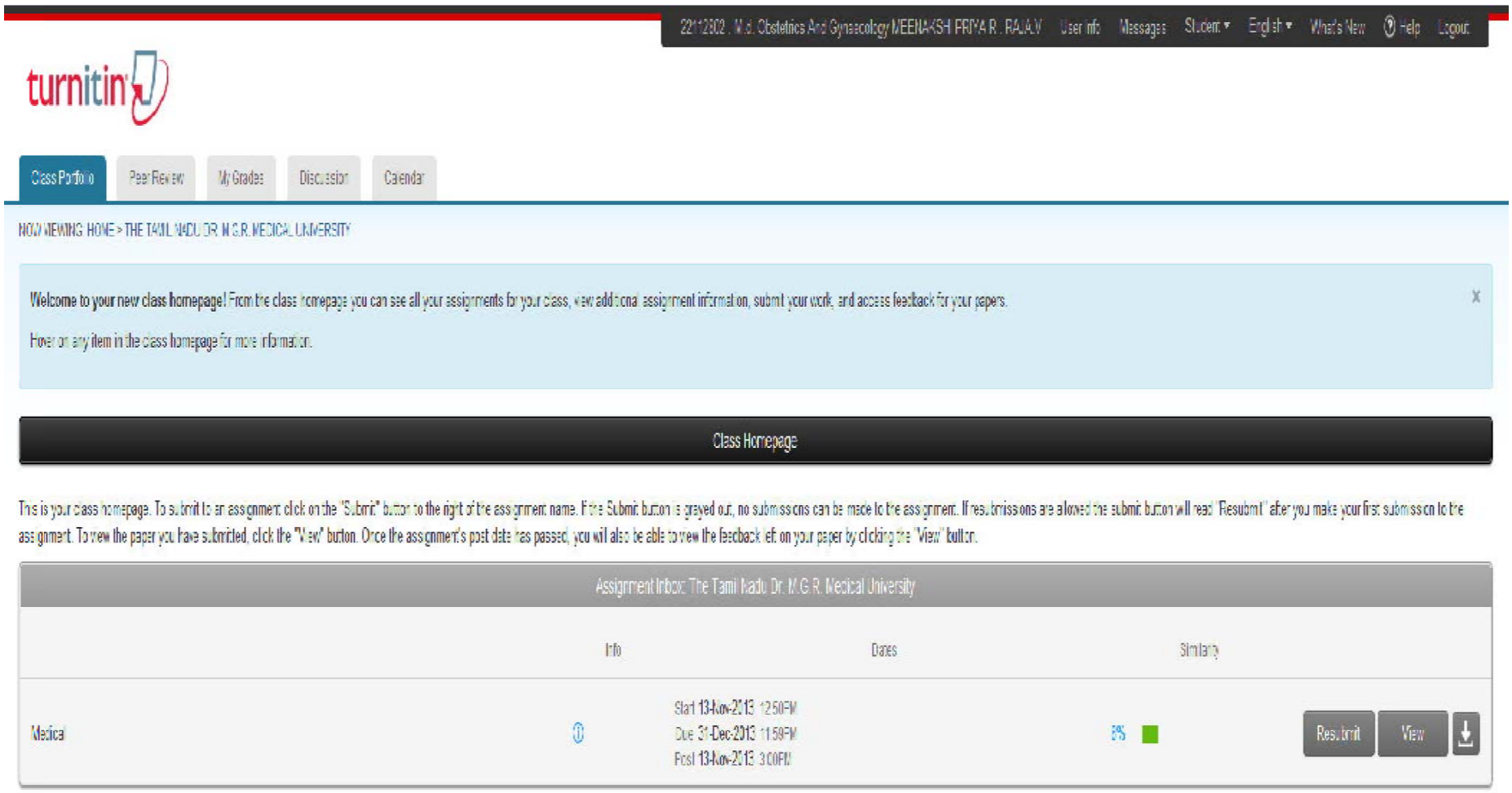
This has reference to the Ethics Committee approval 12/018 dated 03.05.2012 for your thesis proposal and your request for change in dose.

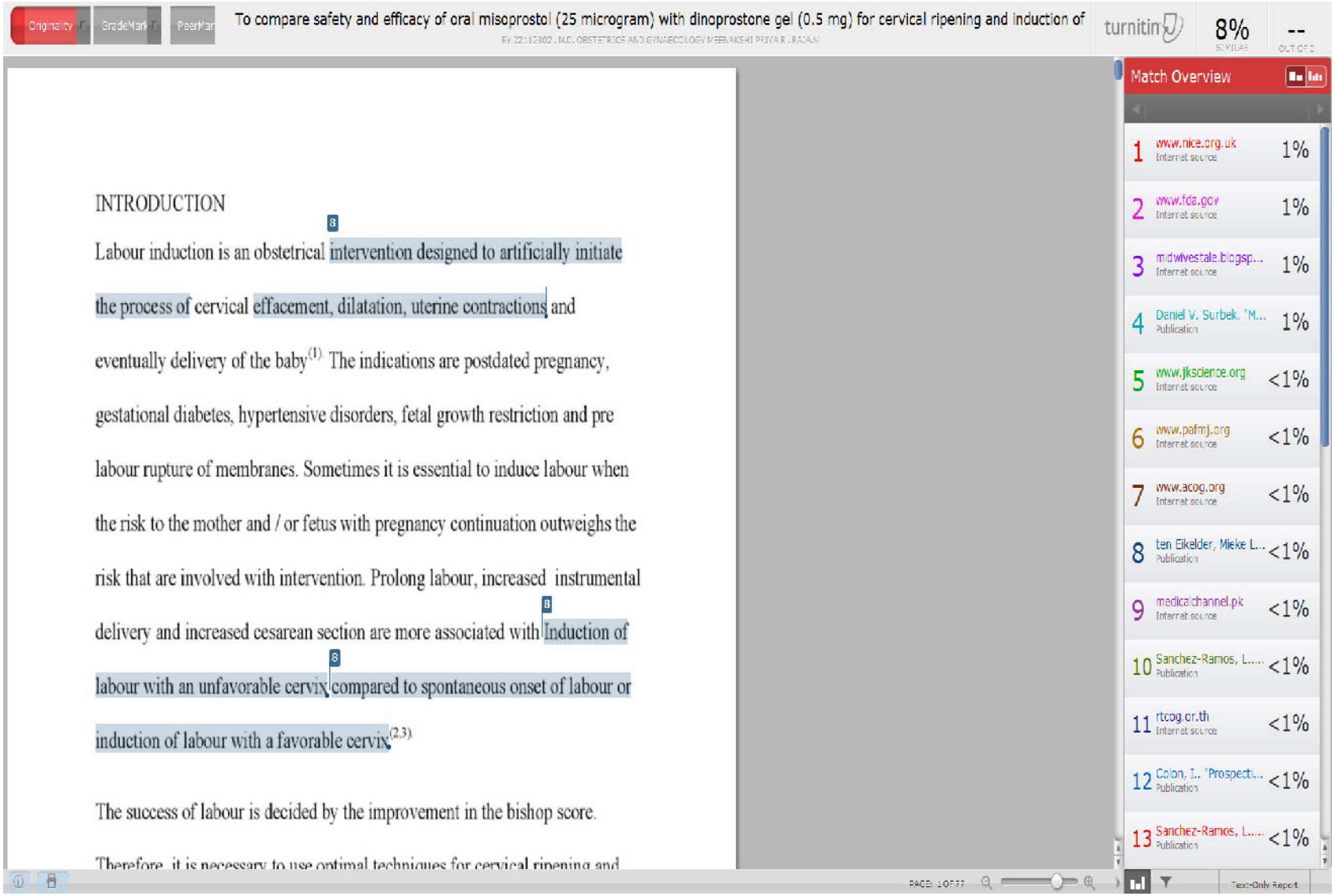
The Ethics Committee approves your request for change in the dosage.

14.8.12

Dr Y S Sivan
Member - Secretary
Institutional Human Ethics Committee

SECRETARY
PSG IMS & R
COIMBATORE-641 004
INSTITUTIONAL HUMAN ETHICS COMMITTEE


22112802 . M.d. Obstetrics And Gynaecology MEENAKSHI PRIYA R . RAJA.V User info Messages Student English What's New Help Logout
turnitin
Class Portfolio
Peer Review
My Grades
Discussion
Calendar
NOW VIEWING: HOME > THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY
Welcome to your new class homepage! From the class homepage you can see all your assignments for your class, view additional assignment information, submit your work, and access feedback for your papers.
Hover on any item in the class homepage for more information.
Class Homepage
This is your class homepage. To submit to an assignment click on the "Submit" button to the right of the assignment name. If the Submit button is greyed out, no submissions can be made to the assignment. If resubmissions are allowed the submit button will read "Resubmit" after you make your first submission to the assignment. To view the paper you have submitted, click the "View" button. Once the assignment's post date has passed, you will also be able to view the feedback left on your paper by clicking the "View" button.
Assignment Inbox: The Tamil Nadu Dr. M.G.R. Medical University
Info
Dates
Similarity
Medica
Start 13-Nov-2013 12:50PM
Due 31-Dec-2013 11:59PM
Post 13-Nov-2013 3:00PM
0%
Resubmit
View


Originality
GradeMark
PeerMark
To compare safety and efficacy of oral misoprostol (25 microgram) with dinoprostone gel (0.5 mg) for cervical ripening and induction of
turnitin
8%
--
INTRODUCTION
Labour induction is an obstetrical intervention designed to artificially initiate the process of cervical effacement, dilatation, uterine contractions and eventually delivery of the baby(1). The indications are postdated pregnancy, gestational diabetes, hypertensive disorders, fetal growth restriction and pre labour rupture of membranes. Sometimes it is essential to induce labour when the risk to the mother and / or fetus with pregnancy continuation outweighs the risk that are involved with intervention. Prolong labour, increased instrumental delivery and increased cesarean section are more associated with induction of labour with an unfavorable cervix compared to spontaneous onset of labour or induction of labour with a favorable cervix(2,3).
The success of labour is decided by the improvement in the bishop score.
Therefore, it is necessary to use optimal techniques for cervical ripening and
Match Overview
1 www.nice.org.uk 1%
2 www.fda.gov 1%
3 midwivestale.blogsp... 1%
4 Daniel V. Surbek, 'M... 1%
5 www.jkscience.org <1%
6 www.pafmj.org <1%
7 www.acog.org <1%
8 ten Eikelder, Mieke L... <1%
9 medicalchannel.pk <1%
10 Sanchez-Ramos, L.... <1%
11 rtcog.or.th <1%
12 Colon, I., 'Prospecti... <1%
13 Sanchez-Ramos, L.... <1%
Text-Only Report

PSG Institute of Medical Science and Research, Coimbatore
Institutional Human Ethics Committee
INFORMED CONSENT

I , Dr.Meenakshi Priya MD.,(OG) postgraduate from the department of Obstetrics and Gynecology of PSG Institue of Medical Science & Research (PSGIMS&R), am carrying out a study on the topic: A comparative study of safety and efficacy of oral misoprostol (25 microgram) with dinoprostone gel (0.5mg) for cervical ripening and induction of labour. under the aegis of the Department of Obstetrics and Gynecology, PSGIMSR

The objectives of this study are:

To compare safety and efficacy of oral misoprostol (25 microgram) with dinoprostone gel (0.5mg) for cervical ripening and induction of labour.

Sample size: 217

Respondants are term antenatal patients who are for induction of labor in PSG hospitals – labour ward,coimbatore

Consent: The above information regarding the study, has been read by me/ read to me, and has been explained to me by the investigator/s. Having understood the same, I hereby give my consent to them to interview me. I am affixing my signature / left thumb impression to indicate my consent and willingness to participate in this study.

Signature / Left thumb impression of the Study Volunteer / Legal Representative:

Signature of the Interviewer with date: Witness:

PROFORMA

NAME:

AGE:

SNO:

OP NO:

IP NO:

ADDRESS:

UNIT:

SOCIO ECONOMIC STATUS:

MENSTRUAL H/O:

OBSTETRIC HISTORY:

ANTENATAL COMPLICATION:

INDICATION FOR INDUCTION:

O/E:

PR:

BP:

TEMP:

PALLOR:

ICTERUS:

CVS:

RS:

P/A:

UTERINE HEIGHT:

PRESENTING PART:

FETAL HEART:

MODE OF INDUCTION:

DATE:

TIME:

P/V:

FACTORS	0	1	2	3
DILATATION	CLOSED	1-2	3-4	>5
EFFACEMENT	25	50	75	>80
CONSISTENCY	FIRM	MED	SOFT	-
POSITION	POST	MID	ANT	-
STATION	-3	-2	-1,0	+1,+2
TOTAL		FAVOURABLE	UNFAVOURABLE	

REINDUCTION SCORE

REASSESSMENT:

FACTORS	0	1	2	3
DILATATION	CLOSED	1-2	3-4	>5
EFFACEMENT	25	50	75	>80
CONSISTENCY	FIRM	MED	SOFT	-
POSITION	POST	MID	ANT	-
STATION	-3	-2	-1,0	+1,+2
TOTAL		FAVOURABLE	UNFAVOURABLE	

POSTINDUCTION SCORE:

NON STRESS TEST:

MODE OF DELIVERY:

INDICATION:

INDUCTION DELIVERY INTERVAL:

BABY DETAILS:

SEX :

WEIGHT:

APGAR:

NICU ADMISSION:

MATERNAL COMPLICATION

COST OF INDUCTION:

Bibliography

1. Mieke LG ten Eikelder, Femke Neervoort, [...], and Kitty W M Bloemenkamp. Induction of labour with a Foley catheter or oral misoprostol at term: the PROBAAT-II study, a multicentre randomised controlled trial.BMC pregnancy and childbirth 2013,13:67

2 .Battista L, Chung JH, Lagrew DC, Wing DA: Complications of labor induction among multiparous women in a community-based hospital system. Am J Obstet Gynecol 2007, 197:241-247.

3 .Vrouenraets FP, Roumen FJ, Dehing CJ, van den Akker ES, Aarts MJ, Scheve EJ: Bishop score and risk of cesarean delivery after induction of labor in nulliparous women.ObstetGynecol 2005, 105:690-697.

4. Amna M, Sikandar R. Misoprostol for induction of labour: the Hyderabad experience. J Liaquat Uni Med Health Sci 2007; 2:56-9.

5. Keirse MJ. Prostaglandins in pre-induction cervical ripening. Meta-analysis of worldwide clinical experience. J Reprod Med 1993; 38 (1 Suppl):89-100.

6. Buser D, Mora G, Arias F. A randomized comparison between misoprostol and dinoprostone for cervical ripening and labour induction in patients with unfavourable cervices. Obstet Gynecol 1997; 89:581-5.

7. Dodd JM, Cowther CA, Robinson JS. Oral misoprostol for induction of labour at term: a randomised controlled trial. BMJ 2006; 332:509-13.

8. . Sarbek DV. Misoprostol for labour induction in term pregnancy: clinical review. Eur Clin Obstet Gynecol 2007; 3:25-9.

9. Sanchez-Ramos L, Kaunitz AM, Del Valle GO. Labor induction with the prostaglandin E1 methyl analogue misoprostol versus oxytocin: a randomized trial. Obstet Gynecol 1993; 81:332–336

10. Song J. Use of misoprostol in obstetrics and gynecology .Obstet Gynecol Surv200;55:503-10

11. Carian SJ, Daniel Blust, O'Brien William. Buccal versus intravaginal misoprostol administration for cervical ripening. Am J Obstet Gynecol2001:186(2):229-233.

12. Muzonzini G, Hofmeyr GJ (2004) Buccal or sublingual misoprostol for cervical ripening and induction of labour. Cochrane Database of Systematic Reviews Issue 4. Art. no.: CD004221. DOI 2004; 0.1002/14651858.CD004221.pub2

13. Kipikasa JH, Adair CD, Williamson J, Breen JM, Medford LK, Sanchez-Ramos L. Use of misoprostol on an outpatient basis for postdate pregnancy. Int J Gynaecol Obstet. 2005 Feb;88(2):108-11. Epub 2004 Dec 28

14. Speert H Obstetrics and Gynaecology in America; A history. Baltimore; Waverly Press 1980.

15. Muhlstein C, MoukengueL Lutringer G.Letravail induit: historique Rev. Fr.Gynecol Obstet 1986; 81: 507-508.

16. York R. The history of induction. Midlife Health Visist Community Nurse. 1984; 20(4): 109-116.

17. Fields H. Induction of labour: Its past, its present and its place. Postgraduate Med 1968; 44(3): 226-31.

18. Karim SMM, Shma SC. Oral administration of prostaglandins for the induction of labour. Br Med J, 1:260-2; 1971

19. Karh S M . , Trussell RR, Patel RC, Hillier K. Response of pregnant human utems toPGEF2alpha induction of labour. Br Med J, 4:62 1-623, 1968

20. Keine MJNC. Endogenous prostaglandins in human parturition. In: Human Parturition. Keirse MJNC, Anderson ABM, Bennebroek Gravenhorst J (eds). The Hague: Leiden University Press, 10 1 - 142, 1979

21. Keirse MJNC, Chalmers I. Methods for inducing labour. In:Chalmers I, Enkin M, Keirse MJNC, eds. Effective care in pregnancy and childbirth. Oxford University Press; 1057-79; 1989

22. Fem GC, Robinson GC. MisoprostoL-a logical therapeutic approach to gastroduodenal mucosal injury induced by non-steroidal anti-inflammatory drugs? J of Clin Pharmacy & Thcrapeutics. 1 6(6): 3 85-409, 199 1

23 .Danforth D N at al 1960.connective tissue changes incident to cervical effacement Am J.Obstet Gynaecol 86:P 939-945

24 .Boulvain M,Kelly A,Irion O,Intracervical prostaglandins for induction of labour.Cochrane database of Systematic review 2008;(1):CD006971

25. Bishop EH (August 1964). "Pelvic scoring for elective induction". Obstet Gynecol 24: 266–8.

26. . Ina May Gaskin, CPM. A Summary of Articles Published in English about Misoprostol (cyclot) for Cervical Ripening or induction of labour. Originally published by www.inamay. com, 2005 – 09 – 05

27. EI - Rafacy H, Calder L, Wheatley DN et al. Cervical ripening with Prostaglandin E1 analogues, Misoprostol and gemeprost. Lancet 1994 ; 343 : 1207 - 09.

28. Powers BL, Wing DA, Carr D, Ewert K, Di Spirito M. Pharmacokinetic profiles of controlled-release hydrogel polymer vaginal inserts containing misoprostol. J Clin Pharmacol. 2008;48:26-34.

29. Mahjabeen, Khawaja NP, Rehman R. Comparison oforal versus vaginal misoprostol for mid-trimester pregnancy termination. J Coll Physicians Surg Pak 2009;19:359-62.

30. Capilla Montes C, Bermejo Vicedo T. Efficacy and safety of misoprostol in obstetrics. Farm Hosp. 2005 ;29:177- 84.

31. Goldberg AB, Greenberg MB, Darney PD. Misoprostol and pregnancy. N Engl J Med 2001; 344:38–47.

32. Friedman MA. Manufacturer's warning regarding unapproved uses of misoprostol. N Engl J Med 2001; 344:61.

33. Zieman M, Fong SK, Benowitz NL. Absorption kinetics Zieman M, Fong SK, Benowitz NL. Absorption kinetics Obstet Gynecol 1997; 90:88–92.

34. Ghazala nasreen,Abeera choudry.Comparison of oral misoprostol with vaginal misoprostol for cervical ripening.Professional Med J Apr-June 2011;18(2): 181-188.

35. Alfirevic Z, Weeks A. Oral misoprostol for induction of labour. Cochrane Database Syst Rev 2006;(2): CD001338

36. Cheng SY, Ming H, Lee JC. Titrated oral compared with vaginal misoprostol for labour induction: a randomized controlled trial. Obstet Gynaecol 2008; 111:119-25. Comment in: Obstet Gynecol 2008; 111:1444-5; author reply 1445.

37. Harman JH, Kim A. Current trends in cervical ripening and labour induction. Am Fam Physician 1999; 60:477-84.

38. Wing DA, Ham D, Paul RH. A comparison of orally administered misoprostol with vaginally administered misoprostol for cervical ripening and labour induction. Am J Obstet Gynecol 1999; 180: 1155-60.

39. Windrim R, Bennett K, Mundle W, Young DC. Oral administration of misoprostol for labour induction: a randomized controlled trial. Obstet Gynecol 1997; 89:392-7. Comment in: Obstet Gynecol 1997; 90:153-4.

40. Abbassi RM, Sirichand P, Rizvi S. Safety and efficacy of oral vs.vaginal misoprostol use for induction of labour at term. J Coll Physicians Surg Pak 2008; 18: 625-9.

41. Nigama A, Singh VK, Dubaya P, Pandeya K, Bhagoliwala A, Prakash A. Misoprostol vs. oxytocin for induction of labour at term. Int J Gynaecol Obstet 2004; 86:398-400.

42. Dodd JM, Crowther CA, Robinson JS. Oral misoprostol forinduction of labour at term: randomised controlled trial. BMJ 2006; 332:509-13.

43. Khatri R, Sharma J, Amatya A. Oral vaginal misoprostol: which route for induction of labour? Nepal J Obstet Gynaecol 2007; 2:23-8 .

44. Dallenbach P, Boulvain M, Viardot C, Irion O. Oral misoprostol or vaginal dinoprostone for labour induction: a randomized controlled trial. Am J Obstet Gynecol 2003; 188:162-7.

45. Shazia Syed1, Rizwana Chaudhri1, Farwa Rizvi2 and Muhammad Afzal.Oral Misoprostol for Induction of Labour: a randomized controlled trial. Journal of the College of Physicians and Surgeons Pakistan 2010, Vol. 20 (2): 102-105

46. Kundodyiwa TW, Alfirevic Z, Weeks AD . Low-dose oral misoprostol for induction of labor: a systematic review.Obstet Gynecol. 2009 Feb;113(2 Pt 1):374-83.

47. Bishop EH. Elective induction of labor. Obstet Gynecol 1955;5:519 – 27

48. Gordon-Wright AP, Elder MG. Prostaglandin E2 tablets used intravaginally for the induction of labor. Br J Obstet Gynaecol 1979;86:32 – 6.

49. Keirse MJ. Prostaglandins in preinduction cervical ripening: meta-analysis of worldwideclinical experience. J Reprod Med 1993;38:89 – 100

50. Sanchez-Ramos L, Kaunitz AM, Del Valle GO, et al. Labor induction with the prostaglandinE1methyl analogue misoprostol versus oxytocin: a randomized trial. Obstet Gynecol 1993; 81:332 – 6.

51. Darroca RJ, Buttino Jr L, Miller J, et al. Prostaglandin E2 gel for cervical ripening in patients with an indication for delivery. Obstet Gynecol 1996;87:228 – 30.

52. Normal JE, Thong KJ, Baird DT. Uterine contractility and induction of abortion in earlypregnancy by misoprostol and mifepristone. Lancet 1991;338:1233 – 6.

53. Tabor B, Anderson J, Stettler B, et al. Misoprostol versus prostaglandin E2 gel for cervicalripening [abstract 605]. Am J Obstet Gynecol 1995;172:425.

54. Sanchez-Ramos L, Kaunitz AM, Wears RL, et al. Misoprostol for cervical ripening and labor induction: a meta-analysis. Obstet Gynecol 1997;89:633 – 42.

55. Sanchez-Ramos L, Kaunitz AM. Misoprostol for cervical ripening and labor induction: a systematic review of the literature. Clin Obstet Gynecol 2000;43:475 – 88.

56. Sanches-Ramos.Induction of labour.obstet Gynecol Clin N Am 32 (2005) 181 – 200

57. Bennett KA, Butt K, Crane JMG, et al. A masked randomized comparison of oral and vaginal administration of misoprostol for labor induction. Obstet Gynecol 1998;92:481 – 6.

58. Kwon JS, Mackenzie VP, Davies GAL. A comparison of oral and vaginal misoprostolfor induction of labour at term: a randomized trial. Am J Obstet Gynecol 1999;180:S128.

59. American College of Obstetricians and Gynecologists. Induction of labor with misoprostol. ACOG Committee Opinion No. 228. Washington, DC7 American College of Obstetricians and Gynecologists; 1999.

60. Jose. L.Bartha; Rafel Comino-Delgado; Oral misoprostol and dinoprostone for cervical ripening and labour induction . A randomized comparison Obstetrics and Gynecology 2000; vol:96,No.3,September p465-469.

61. Wing DA, Jones MM, Rahall A, et al. A comparison of misoprostol and prostaglandin E2 gel for preinduction cervical ripening and labor induction. Am J Obstet Gynecol 1995; 172:1804 – 10

62. Kundodyiwa et al Low-Dose Oral Misoprostol for Labor Induction; VOL. 113, NO. 2, PART 1, FEBRUARY 2009

63. De A, Bagga R, Gopalan S. The routine use of oxytocin after oral misoprostol for labour induction in women with an unfavorable cervix is not of benefit. Aust N Z J Obstet Gynaecol 2006;46:323–9.

64. Abdel-Aleem H. Misoprostol for cervical ripening and induction of labour: RHL commentary (last revised: 1 May 2011). The WHO Reproductive Health Library; Geneva: World Health Organization.

65. WHO model list of essential medicines:15th list, March 2007. Geneva: World Health Organization; 2007 (available at: http:// www.who.int/ medicines/publications/essentialmedicines/en/).

66. Paisarntantiwong R, Getgan M. A comparison between single dose of 50 microg oral misoprostol and 25 microg vaginal misoprostol for labor induction. J Med Assoc Thai. 2005 Oct;88 Suppl 2:S56-62.

67. Langenegger E.J. Odendaal H.J. Grove D. Oral misoprostol versus intracervical dinoprostone for induction of labor: Int J Gynaecol Obstet,2005 Mar;88(3):242-8.Epub 2005 Jan 16

68. Gherman RB, Browning J, O'Boyle A, Goodwin TM. Oral misoprostol vs. intravaginal prostaglandin E2 for preinduction cervical ripening. A randomized trial. The Journal of Reproductive Medicine [2001, 46(7):641-646]

69. Bartha JL, Comino-Delgado R, Garci-Benasach F, Martinez- Del-Fresno P, Moreno-Corral LJ. Oral misoprostol and intracervical dinoprostone for cervical ripening and labor induction: a randomized comparison. Obstet Gynecol 2000;96:465–9.

70. Dallenbach P, Boulvain M, Viardot C, Irion O. Oral misoprostol or vaginal dinoprostone for labour induction: a randomized controlled trial. Obstet Gynecol 2003;188:162–7.

71. Hofmeyr GJ, Alferivic Z, Matonhodze B, Brocklehurst P, Campbell E, Nikodem VC, Titrated oral misoprostol solution for induction of labour: a multi-centre, randomised trial. Br J Obstet Gynaecol 2001;108:952—9.

72. Le Roux PA, Olarogun JO, Penny J, Anthony J. Oral and vaginal misoprostol compared with dinoprostone for induction of labour: a randomized controlled trial. Obstet Gynecol 2002;99:201–5.

73. Witter FR. Prostaglandin E2 preparations for preinduction cervical ripening. Clin Obstet Gynecol 2000;43:469– 74.

74. Barrilleaux PS, Bofill JA, Terrone DA, Magann EF, May WL, Morrison JC. Cervical ripening and induction of labour with misoprostol, dinoprostone gel, and a Foley catheter: a randomized trial of 3 techniques. Am J Obstet Gynecol 2002;186:1124–9.

75. Hofmeyr GJ, Gulmezoglu AM: Vaginal misoprostol for cervical ripening and induction of labour (Cochrane review). In The Cochrane Library. Oxford: Update Software; 2002.

76. Hofmeyr GJ, Gulmezoglu AM: Vaginal misoprostol for cervical ripening and induction of labour (Cochrane review). In The Cochrane Library. Oxford: Update Software; 2002.

77. Lyons C, Beharry K, Akmal Y, Attenello F, Nageotte MP: In vitro response of prostaglandin E2 receptor (EP3) in the term pregnant rat uterus and cervix to misoprostol. Prostaglandins Other Lipid Mediat 2003, 70:317-321

78. Langenegger E.J. Odendaal H.J. Grove D. Oral misoprostol versus intracervical dinoprostone for induction of labor: Int J Gynaecol Obstet,2005 Mar;88(3):242-8.Epub 2005 Jan 16

79. van Gemund N, Scherjon S, LeCessie S, van Leeuwen JH, van Roosmalen J, Kanhai HH: A randomised trial comparing low dose vaginal misoprostol and dinoprostone for labour induction. BJOG 2004, 111:42-49.

80. Cruz AS, Pinto JM, Valerioo. PGE2 gel for enhancement of priming and induction of labour at term in patients with unfavourable cervix. Europ J Obstet Gynaec Reprod Biol 1985; 20:331-336.

81. Trofatter KF, Bowers D, Gall DA. Preinduction cervical ripening with prostaglandin E2 (Prepidil) gel. Am J Obstet Gynecol 1985; 153:268-271

Master Chart

NO	AGE	GRAVIDA	GA	INDICATION FOR INDUCTION	PRESCORE	POSTSCORE	AUGMENTATION	ACCELERATION	MODE OF DELIVERY	INDICATION FOR LSCS	INDUCTION DELIVERY INTERVAL	DOSE	COMPLICATION	APGAR 1min	APGAR5min	cost	post natal comp
1	21	primi	39w	Oligo	3/13	10/13	cytotec	Synto+ARM	LSCS	non progression of labour	20 hrs	2	**nil**	8	9	450	nil
2	23	primi	39w+6d	term	3/13	10/13	nil	ARM	NVD	nil	10hrs	2	nil	8	9	450	nil
3	24	primi	38W+6D	NR, NST	4/13	5/13	Cytotec	ARM	NVD	nil	29hrs	2	nil	8	9	450	nil
4	18	primi	37W	pre eclampsia	3/13	7/13	nil	Synto+ARM	NVD	nil	19hrs	2	nil	8	9	450	nil
5	27	primi	38w+5d	GDM	2/13	9/13	Cytotec	Synto+ARM	NVD	nil	48hrs	3	fetal distress	8	9	675	nil
6	26	primi	39w+6d	term	4/13	7/13	nil	Synto	NVD	nil	48hrs	3	nil	8	9	675	nil
7	23	primi	37W	Oligo	3/13	7/13	Cytotec	Synto+ARM	NVD	nil	20hrs	2	nil	8	9	450	nil
8	29	primi	38w	GDM	3/13	9/13	nil	Synto+ARM	NVD	nil	12hrs	2	hypersti mulation	8	9	450	nil
9	30	primi	38W+4d	term	4/13	10/13	nil	ARM	NVD	nil	10hrs	1	nil	8	9	225	PPH
10	21	primi	37w+4d	TERM	1/13	3/13	cytotec	Synto	LSCS	fetal distress	34hrs	3	fetal distress	7	8	675	NIL
11	21	primi	39w	oligo	2/13	5/13	Cytotec	Synto+ARM	LSCS	non progression of labour	54hrs	3	nil	8	9	675	nil
12	24	primi	38w+2d	Oligo	3/13	4/13	Cytotec	Synto+ARM	LSCS	failed induction	34 hrs	3	fever	7	8	675	nil
13	23	primi	40w+2d	postdated	3/13	7/13	Cytotec	Synto	LSCS	non progression of labour	48hrs	2	nil	7	8	450	nil
14	24	primi	40w+2d	postdated	2/13	3/13	nil	ARM	LSCS	fetal distress	8h	1	fetal distress	5	6	225	nil
15	25	primi	39w	Oligo	2/13	5/13	Cytotec	Synto	NVD	nil	48hrs	3	nil	8	9	675	retained placenta
16	24	primi	39w+2d	Oligo	1/13	3/13	nil	Synto	LSCS	fetal distress	13hrs	2	fetal distress	7	8	450	nil
17	27	primi	40w+2d	post dated	2/13	7/13	nil	Synto	NVD	nil	24hrs	2	nil	8	9	450	nil
18	29	primi	37w+5d	IuGR	4/13	6/13	cytotec	Synto+ARM	NVD	nil	28hrs	2	fetal distress	8	9	450	nil
19	23	primi	40w	GDM	2/13	7/13	nil	Synto+ARM	NVD	nil	14 hrs	1	nil	8	9	225	nil
20	24	primi	39w+3d	GDM	2/13	9/13	nil	Synto	NVD	nil	17 hrs	2	fetal distress	8	9	450	nil
21	27	primi	40w+1d	postdated	3/13	7/13	nil	Synto	NVD	nil	26hrs	3	nil	8	9	675	nil
22	24	primi	39w	IUGR	4/13	5/13	cytotec	Synto+ARM	NVD	nil	48 hrs	3	nil	8	9	675	nil
23	24	primi	38w+2d	pre eclampsia	1/13	3/13	cytotec	ARM	LSCS	failed induction	37 hrs	3	fetal distress	7	8	675	nil
24	30	primi	38w+4d	IUGR	3/13	10/13	nil	ARM	NVD	nil	12 hrs	1	nil	8	9	225	nil
25	25	primi	40w+1d	postdated	3/13	5/13	cytotec	Synto+ARM	NVD	nil	38 hrs	3	nil	8	9	675	nil
26	23	primi	40w+1d	post dated	0/13	8/13	nil	ARM	NVD	nil	10hrs	1	nil	8	9	225	nil
27	28	primi	40w+1d	post dated	4/13	8/13	nil	ARM	NVD	nil	8 hrs 9 min	1	nil	8	9	225	PPH
28	23	primi	38w+5d	non reassuring, NST	2/13	6/13	nil	Synto+ARM	NVD	nil	16hrs	1	fetal distress	8	9	225	nil
29	25	primi	38w	Oligo	1/13	5/13	cytotec	Synto+ARM	NVD	nil	25 hrs 53 min	2	nil	8	9	450	nil
30	27	primi	39w+6d	term	1/13	8/13	nil	Synto	NVD	nil	20 hrs	2	nil	8	9	450	nil
31	21	primi	40w+2d	post dated	2/13	7/13	cytotec	Synto+ARM	LSCS	fetal distress	29 hrs	3	fetal distress	7	8	675	nil
32	18	primi	40w+2d	post dated	1/13	7/13	nil	Synto+ARM	NVD	nil	22 hrs 10 min	3	nil	8	9	675	nil
33	20	primi	40w+1d	post dated	1/13	6/13	nil	Synto	LSCS	fetal distress	29 hrs	3	fetal distress	8	9	675	nil
34	28	primi	37 w	Oligo	1/13	10/13	nil	Synto	NVD	nil	22hrs	2	nil	7	8	450	nil
35	23	primi	40w+1d	post dated	2/13	7/13	nil	Synto+ARM	LSCS	fetal distress	22 hrs 33 min	2	fetal distress	8	9	450	nil

36	19	primi	38w	Oligo	4/13	8/13	nil	ARM	NVD	nil	28hrs	3	nil	4	6	675	nil
37	21	primi	40w+1d	post dated	3/13	5/13	cytotec	Synto+ARM	NVD	nil	30hrs	3	nil	8	9	675	nil
38	21	primi	38w+5d	Oligo	4/13	8/13	nil	Synto+ARM	NVD	nil	13 hrs 12 min	2	nil	4	6	450	nil
39	22	primi	40w+1d	post dated	1/13	2/13	nil	Synto+ARM	LSCS	failed induction	23 hrs 42 min	3	fetal distress	8	9	675	nil
40	28	primi	39w+6d	term	3/13	6/13	cytotec	Synto+ARM	NVD	nil	14hrs 24 min	1	nil	8	9	225	nil
41	24	primi	39w+5d	term	3/13	6/13	nil	Synto	LSCS	fetal distress	13 hrs 26 min	2	fetal distress	8	9	450	nil
42	23	primi	37w+4d	Oligo	0/13	5/13	nil	Synto+ARM	NVD	nil	13 hrs 52 min	3	fetal distress	8	9	675	nil
43	25	primi	39w+1d	term	1/13	6/13	nil	ARM	LSCS	fetal distress	23hrs 45 min	3	fetal distress	7	8	675	nil
44	23	primi	40w+1d	postdated	4/13	7/13	cytotec	Synto+ARM	LSCS	fetal distress	20 hrs 45 min	2	fetal distress	5	5	450	nil
45	22	primi	37w+3d	IUGR	3/13	6/13	nil	Synto+ARM	NVD	nil	19 hrs 22 min	2	nil	8	9	450	nil
46	25	primi	40w	term	2/13	5/13	nil	nil	LSCS	fetal distress	20 hrs 49 min	3	fetal distress	8	9	675	nil
47	23	primi	39w	term	4/13	6/13	cytotec	Synto+ARM	NVD	nil	42 hrs 45 min	3	fetal distress	6	7	675	nil
48	22	primi	40w	term	4/13	5/13	nil	Synto+ARM	NVD	nil	17 hrs	1	nil	7	8	225	nil
49	23	primi	40w	term	3/13	9/13	nil	Synto+ARM	NVD	nil	12 hrs 17 min	1	nil	8	9	225	nil
50	24	primi	40w	term	4/13	5/13	cytotec	Synto+ARM	NVD	nil	29 hrs	2	nil	7	8	450	nil
51	21	primi	40w	term	3/13	6/13	cytotec	Synto+ARM	NVD	nil	27 hrs 8 min	2	nil	7	8	450	nil
52	23	primi	40w+1d	post dated	4/13	10/13	nil	ARM	NVD	nil	5 hrs 33 min	1	nil	8	9	225	nil
53	22	primi	38w	GDM	3/13	5/13	nil	nil	LSCS	fetal distress	14hrs	2	hypersti mulation	5	6	450	nil
54	24	primi	38w+2d	term	3/13	4/13	cytotec	Synto+ARM	LSCS	fetal distress	26hrs	3	fetal distress	6	7	675	nil
55	26	primi	40w+2d	post dated	4/13	5/13	cytotec	Synto+ARM	NVD	nil	29 hrs 15 min	3	fetal distress	4	8	675	nil
56	29	primi	40w+2d	post dated	3/13	6/13	cytotec	Synto	NVD	nil	28 hrs 49 min	3	nil	8	9	675	nil
57	24	primi	40w	term	3/13	6/13	cytotec	Synto+ARM	NVD	nil	15 hrs 30min	1	nil	8	9	225	nil
58	23	primi	38w	oligo	3/13	6/13	cytotec	Synto+ARM	LSCS	fetal distress	37 hrs	3	fetal distress	8	9	675	nil
59	24	primi	40w	term	3/13	9/13	nil	ARM	NVD	nil	9 hrs 48 min	1	nil	8	9	225	nil
60	23	primi	40w	term	2/13	10/13	nil	Synto	NVD	nil	18 hrs	2	nil	8	9	450	nil
61	25	primi	40w	term	1/13	6/13	cytotec	Synto+ARM	NVD	nil	40 hrs	2	fetal distress	6	7	450	nil
62	23	primi	38w	term	4/13	10/13	nil	ARM	NVD	nil	16 hrs	2	nil	8	9	225	nil
63	25	primi	38w	Oligo	2/13	4/13	nil	Synto+ARM	LSCS	fetal distress	17hrs	2	fetal distress	8	8	450	nil
64	23	primi	40w	term	4/13	6/13	cytotec	Synto+ARM	LSCS	fetal distress	27 hrs 49 min	3	fetal distress	5	6	675	nil
65	21	primi	38w	severe PE, IUGR	4/13	6/13	cytotec	Synto+ARM	NVD	nil	25 hrs 37 min	2	nil	8	9	450	nil
66	22	primi	40w	term	3/13	3/13	cytotec	nil	LSCS	failed induction	77 hrs	3	nil	8	9	675	nil
67	26	primi	40w+1d	postdated	4/13	6/13	cytotec	Synto+ARM	NVD	nil	37 hrs	2	nil	8	9	450	nil
68	25	primi	40w	term	3/13	5/13	cytotec	Synto+ARM	NVD	nil	37 hrs	2	nil	8	9	450	nil
69	25	primi	39w	term	2/13	10/13	nil	Synto	NVD	nil	12hrs	1	fetal distress	8	9	225	nil
70	26	primi	40w	term	4/13	5/13	cytotec	ARM	LSCS	fetal distress	24 hrs 35 min	1	fetal distress	8	9	225	nil
71	25	primi	40w+1d	post dated	3/13	5/13	cytotec	Synto+ARM	NVD	nil	20 hrs 39 min	2	nil	8	9	450	nil
72	24	primi	40w	term	2/13	6/13	cytotec	Synto+ARM	NVD	nil	16 hrs	1	fetal distress	8	9	225	nil

73	21	primi	40w	term	3/13	9/13	nil	ARM	NVD	nil	6 1/2 hrs	1	nil	8	9	225	nil
74	22	primi	39w+2d	Oligo	3/13	7/13	cytotec	Synto+ARM	NVD	nil	29 hrs	1	fetal distress	8	9	225	nil
75	21	primi	40w	term	2/13	6/13	cytotec	Synto+ARM	NVD	nil	12 hrs 18 min	1	fetal distress	7	9	225	nil
76	21	primi	39w	Oligo	4/13	5/13	cytotec	Synto	NVD	nil	26 hrs 13 min	1	nil	8	9	225	nil
77	24	primi	39w	term	2/13	9/13	nil	Synto+ARM	NVD	nil	15 hrs 22 min	2	fetal distress	8	9	450	nil
78	26	primi	40w	term	2/13	7/13	nil	Synto	LSCS	fetal distress	17 hrs	1	fetal distress	7	8	225	nil
79	24	primi	40w	term	2/13	4/13	cytotec	Synto+ARM	LSCS	non progression of labour	21 hrs	1	fetal distress	7	8	225	nil
80	24	primi	40w+1d	post dated	1/13	2/13	cytotec	Synto+ARM	NVD		28 hrs	2	nil	8	9	450	nil
81	19	primi	39w	term	4/13	4/13	nil	nil	LSCS	fetal distress	8 hrs	1	hypersti mulation	6	8	225	nil
82	23	primi	40w+1d	postdated	2/13	4/13	cytotec	Synto+ARM	NVD	nil	14 hrs	1	nil	8	9	225	nil
83	23	primi	38w+4d	pre eclampsia	2/13	4/13	cytotec	Synto+ARM	NVD	nil	26 hrs	2	nil	7	8	450	PPH
84	25	primi	40w	term	4/13	6/13	nil	Synto	NVD	nil	20hrs	2	nil	8	9	450	nil
85	24	primi	40w+2d	postdatism	2/13	3/13	cytotec	Synto+ARM	LSCS	nil	34hrs	3	fetal distress	8	9	675	nil
86	23	primi	39w+2d	precious pres	4/13	5/13	cytotec	Synto+ARM	LSCS	nil	33 hrs	2	nil	8	9	450	nil
87	23	primi	40w+1d	postdated	4/13	7/13	nil	Synto	NVD	nil	12 hrs	1	fetal distress	7	8	225	nil
88	24	primi	40 w	term	2/13	4/13	cytotec	Synto+ARM	NVD	nil	20 hrs	1	nil	8	9	225	nil
89	24	primi	38 w	GDM on insulin	4/13	5/13	cytotec	Synto+ARM	NVD	nil	32 hrs	2	nil	8	9	225	nil
90	26	primi	40 w	term	2/13	4/13	cytotec	Synto+ARM	NVD	nil	18 hrs	1	fetal distress	7	8	225	nil
91	26	primi	40w	term	4/13	8/13	nil	Synto	NVD	nil	12 hrs	1	fetal distress	8	9	225	nil
92	25	primi	40w+1d	postdated	2/13	3/13	cytotec	Synto+ARM	LSCS	non progression of labour	30hrs	3	fetal distress	8	9	675	nil
93	23	primi	40w+2d	postdated	3/13	5/13	Cytote c	ARM	LSCS	non progression of labour	37 hrs	2	nil	8	9	450	nil
94	29	primi	38 w	GDM on insulin	3/13	8/13	nil	Synto	NVD	nil	10hrs	1	nil	8	9	225	nil
95	29	primi	40w+2d	postdated	4/13	4/13	cytotec	Synto+ARM	LSCS	fetal distress	24 hrs	2	fetal distress	6	9	450	nil
96	24	primi	40w	term	2/13	5/13	nil	ARM	LSCS	fetal distress	16hrs	2	fetal distress	5	7	450	nil
97	24	primi	39w	GDM on diet	3/13	4/13	cytotec	Synto+ARM	NVD	nil	36 hrs 37 min	2	nil	8	9	450	nil
98	19	primi	40w	term	3/13	7/13	nil	Synto	NVD	nil	12 hrs 28 min	1	nil	7	8	225	nil
99	23	primi	40w+6d	postdated	3/13	4/13	nil	nil	LSCS	fetal distress	13 hrs	2	fetal distress	8	9	450	nil
100	23	primi	40w+1d	postdated	2/13	5/13	nil	Synto+ARM	NVD	nil	13hrs	1	nil	8	9	225	nil
101	25	primi	40w	term	2/13	3/13	cytotec	nil	LSCS	failed induction	36hrs	3	nil	8	9	675	nil
102	26	primi	39w	term	4/13	4/13	cytotec	Synto+ARM	NVD	nil	28 hrs	2	nil	8	9	450	nil
103	26	primi	38w	Oligo	3/13	9/13	nil	ARM	NVD	nil	19 hrs	2	hypersti mulation	8	9	450	nil
104	26	primi	39w+6d	term	2/13	4/13	cytotec	Synto+ARM	NVD	nil	32hr 30 min	2	nil	8	9	450	nil
105	24	primi	40w	term	2/13	3/13	nil	nil	LSCS	fetal distress	14hrs	1	fetal distress	8	9	225	nil
106	23	primi	40w	term	0/13	5/13	nil	Synto+ARM	LSCS	fetal distress	21 hrs	3	fetal distress	7	8	675	nil
107	28	primi	40w+1d	term	2/13	3/13	cytotec	Synto+ARM	LSCS	non progression of labour	23hrs	3	fetal distress	8	9	675	nil

NO	AGE	GRAVIDA	GA	INDICATION FOR INDUCTION	PRESCORE	POSTSCORE	AUGMENTATION	ACCELERATION	MODE OF DELIVERY	INDICATION FOR LSCS	INTERVAL	DOSE	COMPLICATION	APGAR I 1 min	APGAR II 5 min	post natal comp	cost
1	20	primi	38wks	Chronic SHT	4/13	7/13	cytotec	Synto	NVD		49 hrs	3	nil	8	9	PPH	12
2	25	primi	39w+2d	Term	1/13	10/13	nil	nil	LSCS	failed induction	29hrs	3	fetal distress	8	9	nil	12
3	18	primi	41w	postdated	4/13	11/13	nil	nil	NVD		22hrs	2	fetal distress	8	9	nil	8
4	28	primi	40w	Term	2/13	7/13	nil	nil	NVD		12 hrs	1	nil	8	9	nil	4
5	29	Primi	37w	Non reactive NST	3/13	9/13	nil	nil	LSCS	fetal distress	21hrs 23 min	3	fetal distress	7	8	nil	12
6	34	Primi	39w+3d	term	3/13	9/13	cytotec	Synto	NVD	nil	29hrs	3	nil	8	9	nil	12
7	23	primi	39w+6D	term	1/13	9/13	cytotec	Synto	NVD	nil	32hrs	3	nil	8	9	nil	12
8	27	Primi	39w	oligo	3/13	10/13	nil	nil	NVD	nil	11 hrs	1	nil	8	9	nil	4
9	25	Primi	40w	term	1/13	9/13	nil	ARM	NVD	nil	12 hrs	1	nil	8	9	nil	4
10	24	primi	40w	term	1/13	7/13	nil	Synto	NVD	nil	24hrs	3	fetal distress	8	9	nil	12
11	23	primi	37w+4d	term	1/13	7/13	cytotec	nil	LSCS	fetal distress	33h	3	fetal distress	8	9	nil	12
12	26	primi	40w	term	3/13	8/13	cytotec	nil	NVD	nil	29hrs	3	nil	8	9	nil	12
13	23	primi	38w+2d	term	4/13	6/13	nil	nil	NVD	nil	14 hrs	1	nil	8	9	nil	4
14	28	Primi	37w+3D	term	1/13	9/13	nil	Synto	NVD	nil	18hrs	2	nil	8	9	nil	8
15	24	primi	38w+4d	term	3/13	9/13	nil	nil	NVD	nil	14hrs	2	nil	7	9	nil	8
16	23	primi	40w	term	3/13	7/13	nil	Synto	NVD	nil	23hrs	3	nil	7	8	nil	12
17	24	primi	37w+2D	Oligo	4/13	10/13	nil	nil	NVD	nil	5hrs	1	nil	8	9	nil	4
18	23	Primi	39w	IUGR	4/13	10/13	nil	ARM	NVD	nil	12hrs	1	nil	8	9	nil	4
19	27	Primi	40w	term	3/13	10/13	nil	nil	NVD	nil	6hrs	1	nil	8	9	nil	4
20	26	primi	40w	term	4/13	10/13	nil	Synto+ARM	NVD	nil	24 hrs	2	nil	8	9	nil	8
21	23	primi	38w	GDM	3/13	8/13	cytotec	nil	LSCS	non progression of labour	57hrs	3	nil	8	9	nil	12
22	23	Primi	40w	term	2/13	9/13	nil	nil	LSCS	fetal distress	15hrs	2	fetal distress	4	8	nil	8
23	24	primi	40w	term	3/13	6/13	cytotec	nil	NVD	nil	24hrs	2	nil	8	9	nil	8
24	23	primi	40w+1d	postdated	4/13	10/13	nil	nil	NVD	nil	6hrs	1	nil	8	9	nil	4
25	21	primi	40+2	postdated	1/13	9/13	Cytotec	nil	NVD	nil	36hrs	3	nil	8	9	nil	12
26	21	primi	39w	Oligo	4/13	9/13	nil	nil	NVD	nil	16hrs	2	nil	8	9	nil	8
27	20	primi	39w	term	3/13	4/13	cytotec	nil	LSCS	non progression of labour	48hrs	3	fetal distress	7	8	nil	12
28	24	primi	40w	term	3/13	8/13	cytotec	nil	LSCS	failed induction	54 hrs	3	nil	8	9	nil	12
29	24	primi	40w+2	post dated	3/13	3/13	cytotec	nil	LSCS	failed induction	53 hrs	3	nil	8	8	nil	12
30	23	primi	40w+2	post dated	3/13	8/13	nil	ARM	NVD	nil	16hrs	2	nil	8	9	nil	8
31	27	primi	38w	Oligo	2/13	6/13	nil	nil	NVD	nil	22hrs	3	nil	8	9	nil	12
32	26	primi	39w	Oligo	2/13	2/13	nil	nil	LSCS	fetal distress	13h	2	fetal distress	7	9	nil	8
33	34	primi	40w+2d	postdated	0/13	1/13	cytotec	Synto+ARM	NVD	nil	31hrs	3	fetal distress	7	8	nil	12
34	28	primi	39w+5d	term	2/13	3/13	PGE2 gel	nil	LSCS	failed induction	46h	3	nil	8	9	nil	12
35	24	primi	39w+6d	term	1/13	1/13	nil	Synto	NVD	nil	30hrs	3	nil	7	8	nil	12
36	23	primi	37w+6d	Oligo	0/13	9/13	pgE2 gel	nil	LSCS	failed induction	40	3	nil	8	9	nil	12
37	26	primi	40w+1d	post dated	0/13	10/13	nil	nil	NVD	nil	22hrs	3	nil	8	9	nil	12
38	26	primi	39w+4d	term	4/13	10/13	nil	nil	NVD	nil	13hrs	2	nil	8	9	nil	8
39	26	primi	40w+1d	postdated	3/13	7/13	nil	Synto	NVD	nil	21hrs 23 min	2	nil	8	9	nil	8
40	23	primi	37w+6d	GDM	2/13	7/13	nil	Synto	NVD	nil	18hrs	3	nil	7	8	PPH	12

41	23	primi	40w+1d	postdated	4/13	9/13	nil	ARM	NVD	nil	23hrs	3	nil	8	9	perineal tear	12
42	23	primi	38w+2d	Oligo	2/13	6/13	nil	Synto+ARM	NVD	nil	12hrs	1	nil	8	9	nil	4
43	26	primi	40w+1d	postdated	2/13	9/13	cytotec	nil	LSCS	non progression of labour	24hr30min	3	nil	8	9	nil	12
44	25	primi	39w+3d	term	1/13	8/13	nil	Synto+ARM	NVD	nil	22hr15min	3	nil	7	8	nil	12
45	25	primi	40w+1d	postdated	3/13	7/13	nil	Synto+ARM	NVD	nil	24hrs	2	nil	8	9	nil	8
46	26	primi	40w+1d	postdated	2/13	8/13	cytotec	Synto+ARM	NVD	nil	28hrs	3	nil	8	9	perineal tear	12
47	24	primi	40w+2d	post dated	4/13	8/13	nil	Synto+ARM	NVD	nil	18 hrs 9 min	2	fetal distress	7	8	nil	8
48	24	primi	40w	term	4/13	8/13	cytotec	Synto+ARM	LSCS	fetal distress	29 hrs 30 min	3	fetal distress	8	9	nil	12
49	27	primi	38w+4d	IUGR	4/13	8/13	cytotec	Synto+ARM	NVD	nil	26 hrs 43 min	2	nil	7	8	nil	8
50	25	primi	39w+4d	term	3/13	6/13	nil	ARM	NVD	nil	5 hrs 28 min	1	nil	8	9	nil	4
51	23	primi	38w+6d	term	1/13	11/13	PGE2 gel	nil	LSCS	failed induction	48h	3	fetal distress	7	9	nil	12
52	24	primi	38w+3d	term	4/13	8/13	cytotec	Synto+ARM	NVD	nil	25 hrs 14 min	3	nil	8	9	nil	12
53	23	primi	40w	term	3/13	7/13	PGE2 gel	nil	LSCS	failed induction	55 hrs 52 min	3	nil	8	9	nil	12
54	23	primi	38w+ 1d	term	4/13	10/13	nil	nil	NVD	nil	11 hrs 21 min	2	fetal distress	6	7	nil	8
55	26	primi	38w+1d	term	4/13	9/13	nil	nil	NVD	nil	21 hrs 52 min	3	nil	8	9	nil	12
56	26	primi	39w+1d	GDM	3/13	11/13	PGE2 gel	nil	LSCS	fetal distress	48 hrs	3	fetal distress	3	7	nil	12
57	24	primi	38w+3d	term	2/13	6/13	cytotec	Synto+ARM	NVD	nil	47 hrs	3	nil	8	9	nil	12
58	25	primi	40w+1d	postdated	4/13	9/13	nil	Synto+ARM	NVD	nil	21 1/2 hrs	3	fever	8	9	nil	12
59	26	primi	38w+3d	IUGR	4/13	10/13	nil	ARM	NVD	nil	8 hrs 27 min	1	nil	8	9	nil	4
60	24	primi	38w+5d	term	1/13	7/13	nil	Synto+ARM	LSCS	fetal distress	26 hrs 51 min	2	nil	7	8	nil	8
61	26	primi	39w+3d	IUGR	2/13	6/13	nil	ARM	LSCS	fetal distress	16hrs	2	fetal distress	7	8	nil	8
62	23	primi	40w+1d	postdated	1/13	5/13	PGE2	nil	LSCS	failed induction	32h	3	fetal distress	7	8	nil	12
63	24	primi	38w		4/13	11/13	nil	Synto+ARM	NVD	nil	7 hrs	1	nil	3	5	nil	4
64	27	primi	39w+6d	Oligo	3/13	10/13	nil	nil	NVD	nil	9 1/2 hrs	2	nil	8	9	nil	8
65	24	primi	38w	term	3/13	7/13	cytotec	Synto+ARM	NVD	nil	37hrs 24min	3	fever	6	7	nil	12
66	24	primi	38w	term	2/13	8/13	nil	Synto+ARM	NVD	nil	24 hrs 12min	3	fetal distress	6	7	nil	12
67	24	primi	37w	IUGR	2/13	8/13	PGE2	nil	LSCS	failed induction	38h	3	nil	8	9	nil	12
68	23	primi	38w	term	3/13	6/13	cytotec	Synto+ARM	NVD	nil	22 hrs 20 min	2	nil	8	9	nil	8
69	24	primi	40w+3d	postdated	2/13	10/13	nil	Synto	NVD	nil	22 hrs	3	nil	8	9	nil	12
70	26	primi	40w	term	2/13	8/13	PGE2	nil	LSCS	failed induction	32h	3	nil	8	9	nil	12
71	25	primi	40w+1d	post dated	3/13	6/13	cytotec	Synto+ARM	LSCS	fetal distress	37 hrs	3	fetal distress	7	9	nil	12
72	25	primi	38w	Oligo	3/13	8/13	nil	ARM	NVD	nil	11 hrs	1	nil	8	9	nil	4
73	27	primi	40w	term	3/13	9/13	nil	ARM	NVD	nil	12 hrs 18 min	1	nil	8	9	nil	4

74	26	primi	40w+3d	term	2/13	10/13	nil	ARM	NVD	nil	22 hrs	3	nil	8	9	nil	12
75	26	primi	40w	term	1/13	7/13	cytotec	Synto+ARM	LSCS	non progression of labour	33 hrs	2	nil	8	9	nil	8
76	25	primi	40w	term	2/13	5/13	nil	nil	LSCS	fetal distress	10 hrs	1	fetal distress	8	9	nil	4
77	23	primi	40w	term	4/13	6/13	nil	Synto+ARM	NVD	nil	15 hrs 59 min	2	nil	8	9	nil	8
78	23	primi	40w+1d	term	2/13	8/13	cytotec	Synto+ARM	NVD	nil	24hrs	2	fetal distress	8	9	nil	8
79	25	primi	40w	term	2/13	7/13	nil	Synto+ARM	LSCS	fetal distress	26hrs	3	fetal distress	5	8	nil	12
80	24	primi	40w	term	2/13	10/13	PGE2	Synto	NVD	nil	53 hrs	3	nil	8	9	nil	12
81	24	primi	39w	term	3/13	9/13	PGE2	Synto+ARM	LSCS	failed induction	68 hrs	3	nil	8	9	nil	12
82	25	primi	40w	term	2/13	5/13	nil	ARM	LSCS	non progression of labour	22 hrs 46 min	2	fetal distress	7	8	nil	8
83	24	primi	40w+1d	postdated	2/13	8/13	PGE2	Synto+ARM	LSCS	failed induction	54 hrs	3	nil	4	7	nil	12
84	25	primi	38w	term	2/13	9/13	cytotec	Synto+ARM	NVD	nil	42hrs	3	nil	8	9	nil	12
85	26	primi	40w	term	3/13	9/13	nil	Synto+ARM	LSCS	fetal distress	22hrs	3	fetal distress	8	8	nil	12
86	26	primi	40w	term	4/13	5/13	nil	Synto+ARM	LSCS	fetal distress	20 hrs	2	nil	8	9	nil	8
87	23	primi	38w+3d	Non reassuring NST	2/13	7/13	cytotec	Synto+ARM	NVD	nil	54hrs	3	nil	7	8	nil	12
88	23	primi	38w	term	2/13	6/13	cytotec	Synto+ARM	LSCS	fetal distress	48 hrs	3	nil	3	3	nil	12
89	25	primi	40w	term	3/13	4/13	cytotec	Synto	LSCS	non progression of labour	32 hrs	3	nil	8	9	nil	12
90	24	primi	37w+6d	term	2/13	6/13	nil	Synto+ARM	NVD	nil	20 hrs	2	fetal distress	8	8	nil	8
91	25	primi	39w	term	4/13	8/13	nil	ARM	NVD	nil	9 hrs	1	nil	8	9	nil	4
92	24	primi	39w	term	0/13	6/13	nil	Synto+ARM	NVD	nil	26h	3	nil	8	8	nil	12
93	25	primi	38w	IUGR	4/13	10/13	nil	Synto	NVD	nil	12 hrs 25 min	1	nil	8	9	nil	4
94	26	primi	40w+2d	postdated	2/13	7/13	nil	Synto+ARM	NVD	nil	18 hrs 38 min	2	nil	8	9	nil	8
95	25	primi	41w+3d	postdated	4/13	10/13	nil	Synto+ARM	NVD	nil	12 hrs	1	nil	8	9	nil	4
96	27	primi	38w	term	4/13	8/13	nil	Synto	NVD	nil	8 hrs	1	nil	8	9	nil	4
97	26	primi	39w	Oligo	3/13	6/13	nil	ARM	NVD	nil	18 hrs	2	fetal distress	6	7	nil	8
98	25	primi	40	term	4/13	6/13	nil	Synto+ARM	NVD	nil	30 hrs	2	nil	8	9	nil	8
99	23	primi	39w	term	2/13	6/13	cytotec	ARM	NVD	nil	22hrs	2	nil	8	9	nil	8
100	24	primi	39w+2d	term	2/13	6/13	nil	Synto+ARM	NVD	nil	12 hrs	2	nil	8	9	nil	8
101	23	primi	40w+2D	post dated	2/13	6/13	cytotec	ARM	LSCS	failed induction	32 hrs	3	fever	8	9	nil	12
102	21	primi	40w	term	2/13	7/13	nil	Synto+ARM	NVD	nil	12 hrs	1	nil	8	9	nil	4
103	27	primi	39w	term	2/13	7/13	nil	Synto	NVD	nil	14 hrs	2	nil	8	9	nil	8
104	23	primi	40W	term	3/13	6/13	nil	Synto+ARM	NVD	nil	18hrs	2	nil	8	9	nil	8